

TECHNICAL ANALYSIS AS AN INVESTMENT TOOL  
IN THE HONG KONG STOCK MARKET

by

LUM KWOK KEUNG JACKY

林國強

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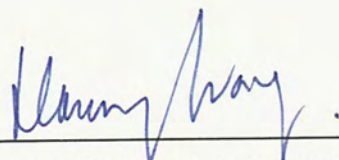
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DR. DANNY S. N. WONG

Advisor

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## ABSTRACT

Technical Analysis Technique as an investment tool in the stock market has often raised strong debate among academicians and investors. Its reliability in forecasting future stock market movement is very controversial despite the fact that the technique is widely used. This research looks into the theoretical supports for the use of Technical Analysis as well as some of the opposing theories to Technical Analysis such as The Random Walk Theory and The Efficient Market Hypothesis. An overview of the previous empirical studies demonstrates that there is a lack of consensus concerning the validity of Technical Analysis.

The ultimate test for an investment strategy is whether such strategy, if applied correctly, would consistently make money. Therefore, applications of Technical Analysis using Hong Kong Stock Market data are performed. Specifically, four commonly used Technical Techniques (Moving Average, Momentum, Diffusion Index, Volume) are chosen for their ease to use and wide acceptance. Evaluation is through comparison with the simple Buy-and-Hold strategy.

The above empirical test finds that, in general, Technical Analysis Technique does not seem to generate exceptional profits for investors in the Hong Kong Stock Market. The return of those trading rules (with the exception of the 3-day moving average Volume method) could not beat the market performance, even before taking into consideration the factors of transaction costs and loss of dividend. Yet, it is evident that Technical Analysis is able to capture major short/intermediate trend market movements. The problems to be solved are inaccurate timing of buy & sell signals and the relatively large percentage of false trading signals given. Such problems have to be solved before Technical Analysis could be profitably applied in the Hong Kong Stock Market.

## ACKNOWLEDGEMENTS

The single name on the cover of this research report belies its multiple authorship. I would like to take this opportunity to thank a number of people who helped to make the completion of this research report possible.

I would like to thank Dr. Danny S. N. Wong for his acting as my advisor of this project and giving me invaluable comments concerning this project. Grateful thanks are also extended to the well-informed staff of the research library of the Stock Exchange of Hong Kong Limited for their invaluable help.

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## CHAPTER I

### INTRODUCTION

#### Relevance To Current Investment Practice

In the United States, approximately 75% of all institutional investors are active investors meaning they would "actively" study the fundamentals of the stocks they invest in. The other 25% of investors, however, are passive investors who only study the price trends of the stocks they invest in. If it can be shown that investing using Technical Analysis Technique can actually outperform the market, it would be a much more efficient way of investing in the stock market. This study on the methods of predicting the stock market trend in the near future would be beneficial to most people whom John Maynard Keynes described as "largely concerned *not* with making superior long-term forecasts of the probable yield of an investment over its whole life, but with foreseeing changes in the conventional basis of valuation a short time ahead of the general public."<sup>1</sup>

In Hong Kong, it is hard to tell exactly the proportion of investors employing Technical Analysis methods. Yet, it is without question that Technical Analysis has long been one of the most frequently used investment tools in the analysis of stock market by both individual investors and investment management company. It is hoped that through this research paper, I can evaluate the applicability of those techniques in the Hong Kong Stock Market which, comparatively speaking, is much younger and smaller than the US stock market.

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1

Keynes, John Maynard. The General Theory of Employment, Interest, and Money. New York : Harcourt Brace Jovanovich. 1964. p.154



### Scope of Study

This research report basically consists of three parts. First is a general discussion of the Technical Analysis method including some of its underlying theories and previous academic studies testing such techniques. Information covered in this session is essentially gathered through literature review. Second part is an empirical application using some Technical Analysis Techniques on the Hong Kong Stock Market. The research method is basically the methods employed by Mr. Stanley S. C. Huang in his book Timing The Stock Market For Maximum Profits which is a text dedicated wholly to the discussion of Technical Analysis method.<sup>2</sup> The research method would be described in more detail in the following sections. The third and last part of this research would be dealing with a general discussion of the research result. I would also make some recommendations and guidelines in employing the Technical Analysis method in the context of the Hong Kong Stock market.

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2

The discussion on the Methodology Section is drawn heavily from the following text. Stanley S.C. Huang. Timing the Stock Market For Maximum Profits. New York : Windsor Books. 1987.



## CHAPTER II

### THE TECHNICAL ANALYSIS METHOD

#### Some Ideas

According to Stanley S. C. Huang<sup>3</sup>, technical analysis is a short-term market analysis with short term meaning a few days, weeks or months. The aim of this technical approach is not to inquire into the causes of market developments, but to infer tendencies from market developments, i.e. transactions themselves. This approach is to examine the market itself, study the changes in price and volume that are taking place in the market, with other related factors like market sentiment and quality of trading. Technical Analysis deals with the psychology and emotional characteristics of investors, which have strong influence on market movements. However, since there is no accurate ways to measure the sentiment and perception of the public directly, Technical Analysis takes an indirect approach. The basic idea is that changing opinions, expectations, and feelings of investors are reflected and thus can be identified through market movements, and such past and current market movements can accurately forecast future actions.

Literally, there are hundreds of technical analysis methods. Mr Ho Siu-Man has pointed out in his research study that the Technical Analysis Techniques include such trend forecasting methods as Time Series, Moving Average, Relative Strength, Directional Movement, Chart, Momentum, Volume, Oscillator Analysis,

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3

Stanley S. C. Huang. Timing the Stock Market For Maximum Profits. New York : Windsor Books. 1987.

Swing and Dow Theory.<sup>4</sup> It is indeed virtually impossible to employ all the Technical Analysis Techniques at the same time since it involves an enormous amount of data analysis. And, since some of them actually overlap with others and would provide more or less the same predictive result, it is not necessary to study all of them.

In this research, I will be using four representative technical analysis methods, namely Moving Averages, Momentum, Diffusion Index and Volume. The reason I chose those methods is that the local Hong Kong Stock Market would provide available data for such analysis. Also, those methods are relatively simple and well accepted by many market users. Some other methods such as short sales ratio of specialists, odd lot activities and the ratio between yield on Treasury-Bills & the dividend yield on stocks would not be applicable in the context of Hong Kong because of different market situation or lack of adequate open market information.

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4

Ho Siu Man, An Applicability Study of Technical Analysis Techniques for Prediction of Price Movement in Foreign Exchange Market, Hong Kong : Chinese University of Hong Kong. 1987. p.5.



## CHAPTER III

### THEORIES BEHIND THE TECHNICAL ANALYSIS METHOD

#### The Controversy

There is a lot of controversy concerning the reliability of using Technical Analysis Techniques as an investment tool despite being extensively used. Most opponents of Technical Analysis Techniques are fundamentalists who believe that investment decisions should be made according to fundamental analysis of either the stock market or individual stocks. Fundamentalists would study factors like a company's market share, its facilities and assets, its research & development expenses, its labour & material costs, its financial conditions, its management etc, which are considered to be the basic/fundamental elements for a company's success. However, fundamental analysis itself is sometimes criticised as being too dependent on subjective judgement and estimation, and for being too slow in response to changes.<sup>5</sup> Thus, we need to look at some of the previous study on Technical Analysis Techniques in order to gain a better understanding of its usage and to see if it is a viable alternative of fundamental analysis.

The most basic premise of Technical Analysis is that stock prices tend to move in a trend. And trends tend to continue until something happens to change the supply-demand balance.<sup>6</sup> In other words, it is possible to predict future

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Frank K. Reilly. Investment. 2nd ed. New York : HRW. 1986. p.3.

6

Edwards, Roberts D and Magee, John, Technical Analysis of Stock Trends. Massachusetts : John Magee, Springfield, 1968.



movement of the stock market through the trends established by past data. The goal of Technical Analysis is to identify these trends and recognize when they reverse themselves. This basic premise is conflicting directly with the random walk theory which suggests that stock prices actually changes in a random manner. This random nature lies on the usual belief that securities prices are affected by news and the occurrence of news is totally unpredictable (otherwise it would not be called news.) Thus, the stock market would move as if it is random since it follows the random pattern of news. Successive market movements are independent of each other and so past trading patterns cannot be used to predict future ones. To go one step further, some investors even suggest that no information available in the market can be used to predict future prices if the stock market is assumed to be an efficient market (Efficient Market Hypothesis). This hypothesis argues that if there was any systematic (nonrandom) relationship between past prices and future prices, knowledge of this systematic relationship would be used by the more intelligent market participants to make a larger profit. Such action by the more intelligent investors would be continued until they could no longer obtain an abnormal profit, and thus the final price would reflect the information from the systematic relationship.

### Some Empirical Tests

Due to the controversy of the issue, a lot of empirical studies have been carried out to test the use of technical analysis, the random walk theory and the efficient market hypothesis. The results could hardly be described as unanimous.

In one study, Eugene Fama had demonstrated the independence of successive stock price changes by carrying out a study which measured the serial



correlations for 30 industrial stocks in the Dow-Jones Industrial Index for a five-year period from 1957-1962.<sup>7</sup> The result of the study suggests that the degree of relationship between successive price changes is actually insignificant, thus supporting strongly the claims of the random walk theory. For Fama's test result, please see appendix 1.

In another study, however, Charles C. Ying found that the effect of both one day's change in price and volume of a stock on the next day's change in its price were significant at 0.01 level while the effect of one day's change in volume on the next day's price was not significant.<sup>8</sup> This result disagrees with Fama's as it shows the dependence of successive price changes, provided that we take into account the interaction of volume factor. Thus, a purely random walk theory might not hold in this case and this implies the possibility of profitable investment through analysing past data.

Concerning the use of a particular trading method to generate abnormal profit, Paul H. Cootner studied the moving average method using 45 stocks with weekly observations from 1956 to 1960.<sup>9</sup> He used a 40-week moving average and a 5% penetration requirement. It was discovered that the moving average rule produced lower profits than the Buy-and-Hold strategy for the total period. However, if the study was carried out on a weekly basis, the moving average (especially the long position only) appears to be superior ( see appendix 2 for test

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7

Eugene Fama, "The Behaviour of Stock Market Prices," *Journal of Business*, January 1965. pp. 34-105.

8

Charles C. Ying, "Stock Market Prices and Volume of Sales," *Econometrica*, Vol. 34 (July 1966). p.679.

9

Paul H. Cootner, "Stock Prices : Random Versus Systematic Changes," *Industrial Management Review*, Vol. 3 (Spring 1962), pp. 24-25.

results). Thus, it is likely that the moving average method is a profitable trading rule for long positions if we can invest the idle money during the time of after selling but before buying signals are generated.

Many other trading methods were also tested in various studies.<sup>10</sup> While tests of some popular methods of Technical Analysis (Advance-Dcline Line, Short-Interest Ratio) gave little evidence of abnormal profitability, tests of other methods like relative-strength, odd-lotter trading have shown economic non-randomness. The general conclusion would be that there is no definite acceptance or denial of the Technical Analysis methods. The methods are still subjected to further study for more creative and profitable use. In fact, it is this indefinite answer that makes the following empirical test more interesting and worthwhile for study.

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For a thorough discussion of this subject, please see H. Russell Fogler. Analysing the Stock Market : Statistical Evidence & Methodology. 2nd ed. Ohio : Columbus. 1979.



## CHAPTER IV

### METHODOLOGY

#### Approach

In order to test if Technical Analysis Technique could be profitably used for investing in the Hong Kong Stock Market, I used the four methods mentioned in Chapter II, namely Moving Average, Momentum, Diffusion Index & Volume to analyse the Hong Kong Stock market. In particular, I applied those methods on the Hang Seng Index. Whenever those technical analysis indicates a buying or selling signal, trading of the entire market portfolio is assumed to be performed (since I am using a composite index rather than one particular stock to evaluate the result).

The result of employing such investment technique is evaluated by comparing the result with the simple method of Buy-and-Hold strategy. Since anyone, by just buying and holding a representative list of stocks, can equal the performance of the market average, I try to decide whether using a particular indicator will yield investment results superior to those of a simple Buy-and-Hold (a representative stock portfolio) strategy. As seen in the above section, the random walk theory would suggest an inability to obtain a profit in excess of Buy-and-Hold Strategy.

Evaluation on profitability thus generated is interpreted by comparing it to the corresponding increase or decrease of the market index for that particular period. The return rate can also be given by the percentage return compared with the Buy-and-Hold strategy. The accuracy in predicting is given by the



number of false signal given in that period. The number of transactions thus produced would also be a factor in evaluating this investing method.

### Data Collection

The data for this research are all open stock market information obtained from the research library of the Hong Kong Stock Exchange. They include the daily closing index of Hang Seng Index, the volume of trading in number of shares, the number of advances and declines for each trading day. All of the data are required information for employing the Technical Analysis methods that I have chosen. Hang Seng Index is used since it is a composite market index which supposedly is able to give a summary result of the entire market. It combines bits of information into a concise measure of the market and tells us where the market stands. In table 1, I have listed the various stocks making up the index in order to show the representativeness of the Hang Seng index.

There are totally data for 248 trading days between January 4 and December 30 of 1988.<sup>11</sup> This would allow me to generate 248 Moving Average data and 248 Diffusion Index and Volume data for analysis. Longer period would have been preferred since that would give a much more thorough analysis of the subject. Yet, in view of limited resources and time constraint, this particular time length is chosen for a complete 1-year study which is deemed to be manageable for analysis. Nineteen Eighty-eight is the year after the world-wide stock market crash and it is hoped that the study of the stock market in this year will be able to shed some light on the market's Post-crash behaviour.

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50-day moving average of Hang Seng Index starts from 1/4/88 since there are exactly 50 trading days between 1/4/88 and 10/19/87 (the crash day).



TABLE 1

HANG SENG INDEX CONSTITUENT STOCKS  
(EFFECTIVE 2/2/1988)

=====	
FINANCE SECTOR (4 STOCKS)	Bank of East Asia Ltd., The Hang Seng Bank Ltd. Hong Kong & Shanghai Banking Corporation, The Jardine Strategic Holdings Ltd.
UTILITIES SECTOR (5 STOCKS)	China Light & Power Co. Ltd. Hong Kong & China Gas Co. Ltd. Hongkong Electric Holdings Ltd. Hong Kong Telecommunications Ltd. Kowloon Motor Bus (1933) Co. Ltd., The
PROPERTIES SECTOR (9 STOCKS)	Cheung Kong (Holdings) Ltd. Hang Lung Development Co. Ltd. Henderson Land Development Co. Ltd. Hongkong Land Co. Ltd., The Hongkong Realty & Trust Co. Ltd. 'A' Hysan Development Co. Ltd. New World Development Co. Ltd. Sun Hung Kai Properties Ltd. Tai Cheung Properties Ltd.
COMMERCE & INDUSTRY SECTOR (15 STOCKS)	Cathay Pacific Airways Ltd. Diary Farm International Holdings Ltd. HK - TVB Ltd. Hutchison Whampoa Ltd. Jardine Matheson Holdings Ltd. Swire Pacific Ltd. 'A' Wharf (Holdings) Ltd., The World International (Holdings) Ltd. Green Island Cement (Holdings) Ltd. Hong Kong Aircraft Engineering Co. Ltd. Winsor Industrial Corporation Ltd. Hongkong & Shanghai Hotels, Ltd., The Miramar Hotel & Investment Co. Ltd. Cavendish International Holdings Ltd. Mandarin Oriental International Ltd.

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Source : Yeung Ming Kung, Glossary of Financial Jargons, Hong Kong :  
Publication (Holdings) Limited, 1988.



## CHAPTER V

### RESULTS

#### Moving Average Analysis

The statistical method of "Moving Average" is able to smooth out a time series, by averaging out random fluctuations and to isolate a basic trend underlying the time series, which in this case is the Hang Seng Index. Moving Average is relatively simple to construct and the use of a spreadsheet usually suffice such calculation. For a 10-Day moving average of Hang Seng Index on day 10, we just need to add up the Hang Seng Index of day 1 to day 10 and then divide the sum by 10. Other moving averages can be constructed in a similar manner.

As stated before, technical analysis is short-term oriented. Many people are only interested in stock market trends in the next few weeks or months. Thus, I would aim at recognising short or intermediate trends by using 10-Day, 30-Day and 50-Day moving averages.

Accordingly, I have constructed in the following table 2 the series of closing indexes of Hang Seng Index for the study period (Jan 4 - Dec 30 of 1988.) There are many ways for the interpretation of moving average figures. But the general principle is that if the index moves above its moving average by a certain percentage, it is a signal to buy and hold until the index drops below the moving average by the same percentage. That percentage is usually called penetration. To be specific, I have employed 3 different methods of interpretations, all of which share this general principle.



### Confirmation by 30-day and 50-day Moving Average

According to S.C. Huang, the decision rules for employing the moving average method are as follow :

1. The short/intermediate trend will probably be upward if the 30-Day Moving average turns upward and at the same time or in the following week the 50-Day Moving Average also turns upward.
2. The short/intermediate trend will probably be downward if the 30-Day Moving Average turns downward while at the same time or in the following week the 50-Day Moving Average also turns downward.

However, if we follow this decision method, there is only one confirmed buying signal on 1/5/88 for the whole study period. This is because the turning upward or downward of the 30-day moving average and the 50-day moving average do not usually occur together in the same day or within two days' time. In fact, there are 20 date which the 30-day moving average indicates a change in direction and only 8 50-day moving average date indicating a change in direction. Thus, we can see that a lot of intermediate movements captured by the 30-day moving average could not be confirmed by the 50-day moving average data. Assuming we close the long position on 12/30/88, the gain through this only transaction is  $2687 - 2403 = 284$  index points. The result of this is not too different from the Buy-and-Hold strategy since this strategy buy only 1 day later than the Buy-and-Hold strategy and hold for the same period of time. It is obvious that we need to employ other methods for buying or selling decision, which hopefully would generate more meaningful transactions.



### Golden Cross and Death Cross

Another way of interpretation is given by Mr. Leo Liu in his article.<sup>12</sup> He mentioned the important concept of buy on "Golden Cross" (10-day moving average greater than the 50-day moving average) and sell on "Death Cross" (10-day moving average smaller than the 50-day moving average). In other words, the intersection of different moving average lines is considered to be the buying and selling signals. Mr. Leo Liu states that this method has wide followers and has demonstrated to be accurate.

If we follow this strategy, we would come up with a number of buy and sell signals and they are listed in the following table 3.

This method generates only 4 transactions for the study period. The total gain is only 138 index points which is far below the simple Buy-and-Hold strategy's performance of gaining 401. Thus, we can see this method does not provide profitable trading.

### Filter Test on Moving Averages

The third method is usually known as the filter test which means that whenever the 10-day, 30-day or 50-day moving average moves up by a fixed percentage, we would buy and hold until the moving averages move down by the same percentage, we would sell. In this case, I would use a very small percentage so that in effect whenever we see a top of those moving averages, a sell signal is assumed. Whenever a bottom is reached, a buy signal is assumed.

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<sup>12</sup>

Leo Liu, "What is Investment - A Candid View" in CUMBA Evolution 1966-1988. p.56.



The result of the analysis is being tabulated in table 4.

All of the moving averages do not generate profits comparable to the simple Buy-and-Hold strategy. However, we could see that the 10-day method is better since it produce much better result than the other 2 moving averages. 10-day moving average provides more occasions for switching and thus can profit from the minor moves of the market. 50-day moving average actually result in a loss since it is relatively slow in capturing the moves in the market. Although the method is able to capture the major short/intermediate trend, it could be seen that there are quite a number of false signals given by these short term indicators, which considerably reduces its reliability.

### Momentum

After identifying the market trend using the Moving Averages method, it is also necessary to recognise the strength of the trend so that we can see if the tendency for this trend would continue before a new supply and demand balance emerge. And the best way to do so is to find out the speed, or rate of change or the momentum of the trend's movement.

In order to calculate the rates of changes in stock index, we have to find the percentage change of the stock index between today's closing index and that of five trading days ago. This would provide us the idea of how strong the current trend is. A strong momentum usually implies continuation of a current trend. In order to smooth out the possible random changes underlying this basic trends, it is necessary that we take the 5-Day and 10-Day Moving Averages of those momentum figures.

Accordingly, I have constructed in the following table 5, the rate of change



analysis data for the Hang Seng Index.

The interpretation of momentum or the rate of change figures is that an upward trend is given if the rate of decline in the 5-day moving average becomes less than 1% (i.e.  $< -1\%$ ) and at the same time the current rate of change of the index as compared with 5 days before has turned into a positive figure. An downward trend is given when the rate of increase in the 5-day moving average becomes less than 1% (i.e.  $< 1\%$ ) and at the same time the current rate of change of the index as compared with 5 days before has turned into a negative figure.

With this decision method, the various indications of buy and sell date are identified for the study period. The results are given in the following table 6 which shows the list of buy and sell signals with the corresponding closing Hang Seng Index of each date. The gain/loss through each transaction is also calculated.

We can see that the 5-day moving average method yield a gain of 389 index points while the 10-day method yield only 158 points. During the period, there are 4 major upward moves (2/16, 6/2, 10/7, 11/21) which the 5-day moving average momentum method captures successfully while the 10-day moving average momentum only capture 3 out of 4. Also, the 10-day moving average tends to give signal later than the 5-day method so that the market index might have advanced or declined substantially before being captured. Although this momentum method is shown to be a better indicator as compared with the moving average method in the previous section since it is more sensitive to the market trends, it is still below the market performance of gaining 401 index points.



### Diffusion Index of Advancing and Declining Issues

The diffusion index is defined as a statistical series which shows the relative percentage of items in a group which is rising at any given time. Thus, it is able to delineate how individual issues are performing in the current trend of the stock market. The diffusion index is important for prediction purpose since it has the characteristic of changing direction before the aggregate does so. In other words, it is a leading indicator of the market. Even though it starts dropping from a high level, the aggregate would continue to ascend until the diffusion index comes to the level of 50 percent before the two index would move in the same direction.

It is simple to calculate the diffusion index. We first add the number of advances and declines for a particular day and then the number of advances in that day is divided by the sum obtained. The result, when expressed in percentage term, would be the diffusion index. We again take the 3-day moving average for the diffusion index so that we can get the underlying trend. The data are listed in the following table 7.

The Diffusion Index is more difficult to interpret since it fluctuates widely. We have to take into consideration 3 factors for its interpretation, namely the direction of the diffusion index (going up or down), the direction of the diffusion index with respect to the direction of the Hang Seng Index, and the absolute level of the diffusion index i.e. whether it is above or below the 50% line.

For the direction of diffusion index, generally speaking, a rising diffusion index indicates a upward trend while a falling one shows a downward trend.

For the direction of the diffusion index with respect to the direction of the Hang Seng Index, if the diffusion index and Hang Seng Index rise or fall at the



same time, it is likely the prevailing stock market trends would continue. However, if the two is moving in different directions, it is likely that the Hang Seng Index would follow the trend of diffusion index later.

Concerning the absolute level of diffusion index, if the diffusion index is smaller than 45%, the trend is often considered to be downward. On the other hand, when it is higher than 55%, the trend is considered to be upward.

Since the 3 factors are interacting with each other at the same time, it would be better to construct a chart (Figure 1) to visualize their effects at the same time in order to arrive at more accurate buying and selling signals. The date of each buy & sell signal thus identified are listed in the following table 8, with the gain and loss of each transaction calculated.

It could be seen that the result of this method fairly approximates the performance of the market. It achieves a total gain of 378 index points which is not far from the Buy-and-Hold strategy. It is successful in capturing major upward moves while only lose slightly in giving some false transaction signals. In other words, this method does not perform extremely bad as compared with the market itself. And upon refinement of the trading rules, it is possible that this could become a very useful technical indicator.

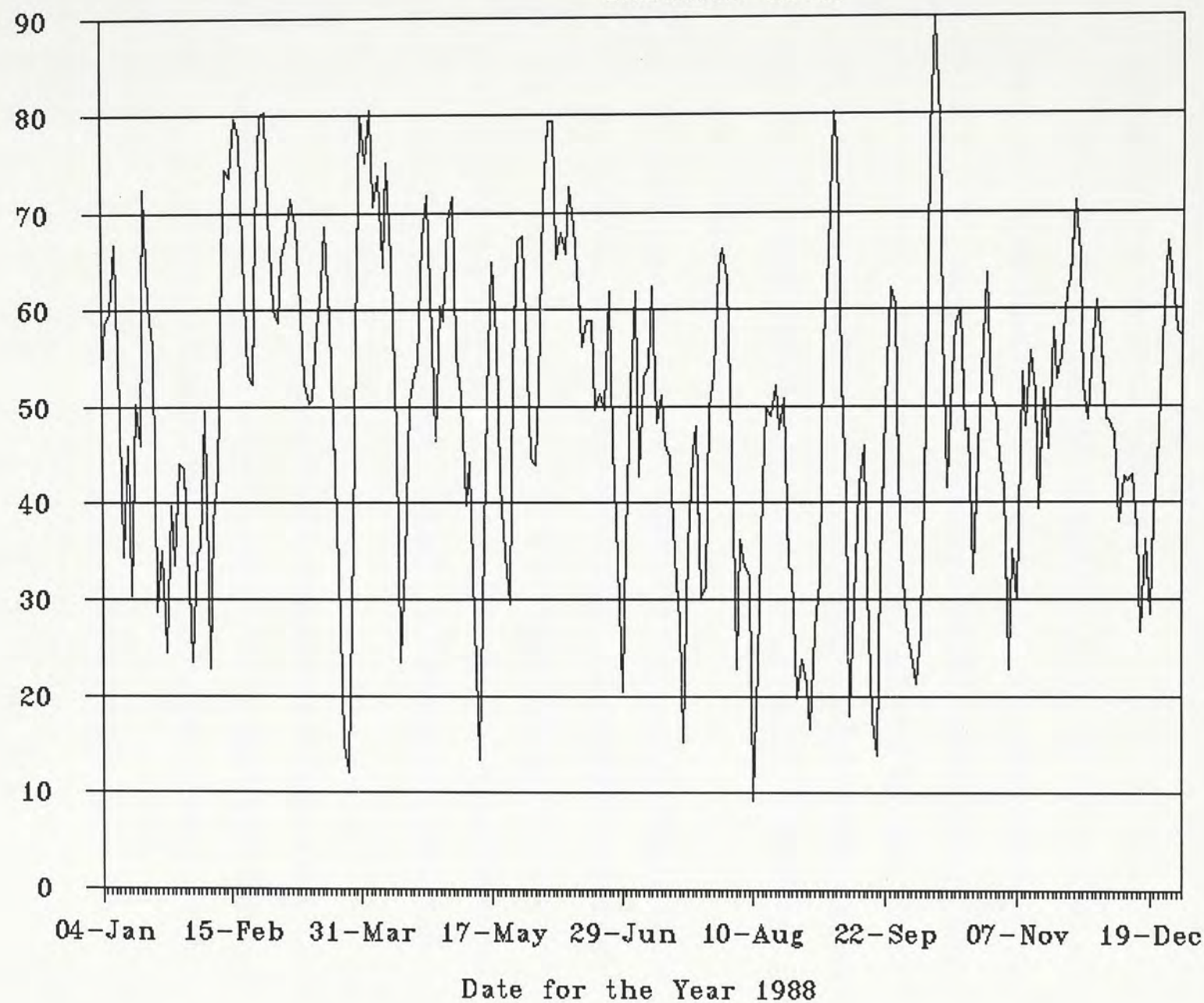
### Volume

A lot of "technical" investors believe not only does the technical indicators of the stock market index would provide important trading signals, but the volume data itself also plays an important role in the prediction of future movements of stock prices in terms of the market index i.e. Hang Seng Index.

In table 9, I have listed the volume data for the study period. Again, in

Diffusion Index of Advancing Issues

Figure 1 : 3-day Moving Average of the  
Diffusion Index





order to smooth out the time series, I have also calculated the 3-day and 10-day moving averages of the volume figure.

Generally, the interpretation method for volume figure is to relate the volume factor to the direction of the market index. In the case when the stock market is moving up, an increase in volume would be a upward trend indicator whereas a decrease in volume would be an downward trend indicator. On the other hand, in the case when the market is moving down, an increase in volume would be an downward trend indicator whereas an decrease in volume would be an upward trend indicator.

With such decision rule, the corresponding buying and selling signal are identified. Results are listed in the following table 10. (the High, Low figure for 3-day and 10-day moving averages are first identified, the days following such high or low figure would then start a new trend for the volume and if this trend matches with the above-mentioned movements of the Hang Seng index, buy or sell actions are taken.)

We can see that this method is able to capture most of the major move for the study period. In fact, the 3-day moving average is able to perform better than the simple Buy-and-Hold strategy by 19% as it achieves a total gain of 477 points.



TABLE 2

Hang Seng Index and its 10-Day, 30-Day & 50-Day  
Moving Average For the Year 1988

Date	Hang Seng Index	10-Day Mov. Avg.	30-Day Mov. Avg.	50-Day Mov. Avg.
04-Jan	2286	2290.8	2155.0	2195.0
05-Jan	2403	2313.1	2161.3	2175.9
06-Jan	2463	2331.6	2172.0	2180.3
07-Jan	2453	2349.3	2182.6	2181.4
08-Jan	2461	2362.8	2191.8	2183.2
11-Jan	2401	2365.0	2199.2	2187.2
12-Jan	2442	2380.5	2207.5	2191.2
13-Jan	2384	2388.8	2215.7	2194.8
14-Jan	2412	2400.8	2225.8	2199.4
15-Jan	2430	2413.5	2236.7	2206.5
18-Jan	2512	2436.1	2251.9	2217.5
19-Jan	2488	2444.6	2268.4	2225.0
20-Jan	2484	2446.7	2288.0	2231.9
21-Jan	2412	2442.6	2302.2	2239.3
22-Jan	2422	2438.7	2316.8	2246.8
25-Jan	2407	2439.3	2329.4	2251.9
26-Jan	2426	2437.7	2343.9	2255.9
27-Jan	2413	2440.6	2356.3	2257.9
28-Jan	2413	2440.7	2367.4	2260.4
29-Jan	2410	2438.7	2376.2	2262.9
01-Feb	2358	2423.3	2383.4	2264.9
02-Feb	2299	2404.4	2387.4	2266.6
03-Feb	2354	2391.4	2389.9	2270.8
04-Feb	2295	2379.7	2390.5	2274.0
05-Feb	2293	2366.8	2389.4	2276.2
08-Feb	2224	2348.5	2384.3	2277.1
09-Feb	2223	2328.2	2382.1	2277.7
10-Feb	2233	2310.2	2379.9	2279.6
11-Feb	2256	2294.5	2378.7	2282.5
12-Feb	2287	2282.2	2378.1	2286.2
15-Feb	2302	2276.6	2378.7	2291.1
16-Feb	2328	2279.5	2376.2	2297.8
22-Feb	2347	2278.8	2372.3	2306.8
23-Feb	2329	2282.2	2368.2	2313.7
24-Feb	2336	2286.5	2364.0	2320.7
25-Feb	2356	2299.7	2362.5	2327.3
26-Feb	2384	2315.8	2360.6	2335.2
29-Feb	2418	2334.3	2361.7	2342.7
01-Mar	2455	2354.2	2363.1	2350.2
02-Mar	2462	2371.7	2364.2	2356.5
03-Mar	2468	2388.3	2362.7	2363.0
04-Mar	2472	2402.7	2362.2	2368.9
07-Mar	2470	2415.0	2361.7	2372.7
08-Mar	2493	2431.4	2364.4	2377.0



TABLE 2 (Continued)

Hang Seng Index and its 10-Day, 30-Day & 50-Day  
Moving Average For the Year 1988

Date	Hang Seng Index	10-Day Mov. Avg.	30-Day Mov. Avg.	50-Day Mov. Avg.
09-Mar	2552	2453.0	2368.8	2381.6
10-Mar	2591	2476.5	2374.9	2385.8
11-Mar	2595	2497.6	2380.5	2392.0
14-Mar	2585	2514.3	2386.3	2397.6
15-Mar	2579	2526.7	2391.8	2403.4
16-Mar	2555	2536.0	2396.6	2408.4
17-Mar	2581	2547.3	2404.1	2414.3
18-Mar	2608	2560.9	2414.4	2418.4
21-Mar	2603	2574.2	2422.7	2421.2
22-Mar	2595	2584.4	2432.7	2424.1
23-Mar	2562	2585.4	2441.6	2426.1
24-Mar	2546	2580.9	2452.4	2429.0
25-Mar	2502	2571.6	2461.7	2430.2
28-Mar	2467	2559.8	2469.5	2431.8
29-Mar	2522	2554.1	2478.3	2434.0
30-Mar	2529	2551.5	2486.4	2436.0
31-Mar	2544	2547.8	2494.5	2436.7
06-Apr	2557	2542.7	2502.1	2438.0
07-Apr	2623	2544.7	2511.3	2440.8
08-Apr	2620	2547.2	2521.0	2445.0
11-Apr	2651	2556.1	2531.5	2449.6
12-Apr	2636	2565.1	2540.8	2454.1
13-Apr	2671	2582.0	2550.4	2459.0
14-Apr	2684	2603.7	2559.3	2464.5
15-Apr	2599	2611.4	2564.1	2468.2
18-Apr	2552	2613.7	2567.1	2471.0
19-Apr	2594	2618.7	2571.3	2475.7
20-Apr	2578	2620.8	2574.8	2481.3
21-Apr	2553	2613.8	2577.6	2485.3
22-Apr	2591	2610.9	2580.8	2491.2
25-Apr	2624	2608.2	2583.2	2497.8
26-Apr	2586	2603.2	2583.1	2505.1
27-Apr	2592	2595.3	2583.0	2512.5
28-Apr	2588	2585.7	2583.1	2519.6
29-Apr	2603	2586.1	2583.9	2526.5
02-May	2590	2589.9	2585.0	2532.6
03-May	2603	2590.8	2585.8	2538.6
04-May	2641	2597.1	2586.9	2544.8
05-May	2578	2599.6	2586.0	2549.5
06-May	2572	2597.7	2585.3	2554.3
09-May	2584	2593.7	2586.0	2559.3
10-May	2563	2591.4	2586.6	2563.4
11-May	2534	2585.6	2587.6	2566.4
12-May	2509	2577.7	2589.0	2568.2



TABLE 2 (Continued)

Hang Seng Index and its 10-Day, 30-Day & 50-Day  
Moving Average For the Year 1988

Date	Hang Seng Index	10-Day Mov. Avg.	30-Day Mov. Avg.	50-Day Mov. Avg.
13-May	2533	2570.7	2589.4	2569.8
16-May	2538	2565.5	2589.7	2571.3
17-May	2534	2558.6	2589.4	2572.6
18-May	2533	2547.8	2588.6	2573.9
19-May	2507	2540.7	2584.7	2574.6
20-May	2491	2532.6	2580.4	2574.6
23-May	2490	2523.2	2575.0	2573.3
24-May	2516	2518.5	2571.0	2571.8
25-May	2528	2517.9	2566.3	2570.5
26-May	2520	2519.0	2560.8	2569.2
27-May	2514	2517.1	2558.0	2567.9
30-May	2489	2512.2	2555.9	2566.6
31-May	2497	2508.5	2552.6	2564.9
01-Jun	2516	2506.8	2550.6	2563.0
02-Jun	2547	2510.8	2550.4	2561.9
03-Jun	2568	2518.5	2549.6	2561.4
06-Jun	2590	2528.5	2548.5	2561.9
07-Jun	2587	2535.6	2548.5	2562.8
08-Jun	2609	2543.7	2549.1	2564.9
09-Jun	2641	2555.8	2550.8	2568.4
10-Jun	2647	2569.1	2552.3	2570.9
14-Jun	2673	2587.5	2555.1	2573.8
15-Jun	2700	2607.8	2558.3	2576.9
16-Jun	2694	2625.6	2560.1	2579.6
17-Jun	2718	2642.7	2564.7	2581.5
20-Jun	2719	2657.8	2569.6	2583.5
21-Jun	2684	2667.2	2573.0	2584.2
22-Jun	2704	2678.9	2577.7	2585.5
23-Jun	2712	2689.2	2583.6	2586.3
24-Jun	2708	2695.9	2590.2	2586.8
27-Jun	2690	2700.2	2595.5	2588.6
28-Jun	2661	2699.0	2599.6	2590.8
29-Jun	2648	2693.8	2603.4	2591.9
30-Jun	2671	2691.5	2608.0	2593.8
01-Jul	2685	2688.2	2613.9	2596.4
04-Jul	2688	2685.1	2620.5	2598.3
05-Jul	2682	2684.9	2626.9	2599.5
06-Jul	2738	2688.3	2634.3	2602.5
07-Jul	2760	2693.1	2642.0	2605.9
08-Jul	2753	2697.6	2649.8	2609.2
11-Jul	2760	2704.6	2658.0	2612.3
12-Jul	2773	2715.8	2667.4	2616.0
13-Jul	2745	2725.5	2675.7	2618.8
14-Jul	2753	2733.7	2683.6	2621.1



TABLE 2 (Continued)

Hang Seng Index and its 10-Day, 30-Day & 50-Day  
Moving Average For the Year 1988

Date	Hang Seng Index	10-Day Mov. Avg.	30-Day Mov. Avg.	50-Day Mov. Avg.
15-Jul	2741	2739.3	2690.1	2624.3
18-Jul	2711	2741.6	2694.8	2627.1
19-Jul	2678	2741.2	2697.8	2629.0
20-Jul	2698	2737.2	2701.5	2631.7
21-Jul	2687	2729.9	2704.1	2634.8
22-Jul	2662	2720.8	2704.8	2637.8
25-Jul	2647	2709.5	2704.8	2640.1
26-Jul	2656	2697.8	2704.2	2642.5
27-Jul	2665	2689.8	2703.0	2645.1
28-Jul	2663	2680.8	2702.0	2647.7
29-Jul	2679	2674.6	2700.7	2651.1
01-Aug	2703	2673.8	2700.2	2655.4
02-Aug	2701	2676.1	2700.7	2659.6
03-Aug	2693	2675.6	2700.4	2663.1
04-Aug	2677	2674.6	2699.2	2666.1
05-Aug	2671	2675.5	2698.0	2669.1
08-Aug	2659	2676.7	2696.9	2672.0
09-Aug	2634	2674.5	2696.0	2674.9
10-Aug	2579	2665.9	2693.7	2676.6
11-Aug	2395	2639.1	2684.5	2674.1
12-Aug	2601	2631.3	2681.7	2675.2
15-Aug	2601	2621.1	2678.8	2675.9
16-Aug	2589	2609.9	2675.7	2675.9
17-Aug	2595	2600.1	2671.0	2676.0
18-Aug	2571	2589.5	2664.7	2675.3
19-Aug	2580	2580.4	2658.9	2674.0
22-Aug	2564	2570.9	2652.4	2672.4
23-Aug	2532	2560.7	2644.3	2669.6
24-Aug	2520	2554.8	2636.8	2666.0
25-Aug	2521	2567.4	2629.1	2662.5
26-Aug	2465	2553.8	2619.9	2657.4
30-Aug	2440	2537.7	2610.9	2651.9
31-Aug	2444	2523.2	2603.1	2647.1
01-Sep	2433	2507.0	2594.2	2641.6
02-Sep	2450	2494.9	2586.3	2636.4
05-Sep	2508	2487.7	2581.2	2632.4
06-Sep	2502	2481.5	2576.4	2628.6
07-Sep	2525	2480.8	2572.0	2625.9
08-Sep	2509	2479.7	2566.8	2623.1
09-Sep	2497	2477.3	2561.3	2619.7
12-Sep	2469	2477.7	2554.3	2615.3
13-Sep	2474	2481.1	2546.6	2611.1
14-Sep	2482	2484.9	2539.3	2607.1
15-Sep	2474	2489.0	2532.0	2601.8



TABLE 2 (Continued)

Hang Seng Index and its 10-Day, 30-Day & 50-Day  
Moving Average For the Year 1988

Date	Hang Seng Index	10-Day Mov. Avg.	30-Day Mov. Avg.	50-Day Mov. Avg.
16-Sep	2459	2489.9	2524.8	2595.8
19-Sep	2448	2483.9	2517.3	2589.7
20-Sep	2423	2476.0	2509.5	2582.9
21-Sep	2432	2466.7	2502.7	2576.1
22-Sep	2456	2461.4	2498.6	2570.3
23-Sep	2454	2457.1	2500.6	2564.3
27-Sep	2466	2456.8	2496.1	2558.8
28-Sep	2450	2454.4	2491.1	2553.6
29-Sep	2439	2450.1	2486.1	2548.8
30-Sep	2441	2446.8	2480.9	2543.7
03-Oct	2430	2443.9	2476.2	2538.6
04-Oct	2416	2440.7	2470.8	2533.6
05-Oct	2417	2440.1	2465.9	2529.0
06-Oct	2427	2439.6	2462.4	2524.5
07-Oct	2479	2441.9	2461.0	2520.7
10-Oct	2566	2453.1	2462.5	2518.8
11-Oct	2572	2463.7	2466.1	2516.7
12-Oct	2552	2473.9	2469.8	2513.6
13-Oct	2562	2486.2	2473.7	2510.9
14-Oct	2593	2501.4	2479.1	2508.9
17-Oct	2594	2517.8	2483.9	2507.2
18-Oct	2590	2535.2	2486.6	2505.6
20-Oct	2584	2551.9	2489.3	2504.1
21-Oct	2582	2567.4	2491.2	2503.0
24-Oct	2562	2575.7	2493.0	2502.7
25-Oct	2585	2577.6	2495.9	2506.5
26-Oct	2611	2581.5	2500.7	2506.7
27-Oct	2617	2588.0	2505.4	2507.0
28-Oct	2614	2593.2	2509.8	2507.5
31-Oct	2627	2596.6	2514.9	2508.2
01-Nov	2615	2598.7	2520.1	2509.0
02-Nov	2608	2600.5	2525.5	2509.6
03-Nov	2584	2600.5	2530.8	2510.0
04-Nov	2585	2600.8	2535.9	2511.1
07-Nov	2567	2601.3	2539.6	2512.0
08-Nov	2587	2601.5	2544.1	2513.3
09-Nov	2583	2598.7	2548.0	2515.7
10-Nov	2577	2594.7	2552.2	2518.4
11-Nov	2584	2591.7	2557.0	2521.2
14-Nov	2538	2582.8	2560.3	2523.3
15-Nov	2569	2578.2	2564.9	2525.7
16-Nov	2567	2574.1	2569.9	2526.9
17-Nov	2569	2572.6	2575.0	2528.2
18-Nov	2581	2572.2	2580.1	2529.3



TABLE 2 (Continued)

Hang Seng Index and its 10-Day, 30-Day & 50-Day  
Moving Average For the Year 1988

Date	Hang Seng Index	10-Day Mov. Avg.	30-Day Mov. Avg.	50-Day Mov. Avg.
21-Nov	2582	2573.7	2583.6	2530.8
22-Nov	2599	2574.9	2584.7	2532.8
23-Nov	2634	2580.0	2586.7	2536.1
24-Nov	2666	2588.9	2590.5	2540.0
25-Nov	2656	2596.1	2593.7	2543.5
28-Nov	2625	2604.8	2594.7	2546.5
29-Nov	2633	2611.2	2596.0	2550.0
30-Nov	2659	2620.4	2598.3	2554.2
01-Dec	2668	2630.3	2601.1	2559.1
02-Dec	2667	2638.9	2604.0	2563.8
05-Dec	2671	2647.8	2607.6	2568.1
06-Dec	2677	2655.6	2610.7	2572.5
07-Dec	2690	2661.2	2613.3	2577.0
08-Dec	2680	2662.6	2615.4	2581.6
09-Dec	2671	2664.1	2617.3	2586.3
12-Dec	2666	2668.2	2618.6	2590.8
13-Dec	2652	2670.1	2619.8	2595.2
14-Dec	2642	2668.4	2621.0	2599.7
15-Dec	2627	2664.3	2622.4	2603.9
16-Dec	2629	2660.5	2623.9	2608.0
19-Dec	2612	2654.6	2625.4	2610.6
20-Dec	2608	2647.7	2626.1	2611.5
21-Dec	2633	2642.0	2627.7	2612.7
22-Dec	2643	2638.3	2629.9	2614.5
23-Dec	2657	2636.9	2632.4	2616.4
28-Dec	2696	2639.9	2637.6	2618.5
29-Dec	2692	2643.9	2641.7	2620.4
30-Dec	2687	2648.4	2645.7	2622.4

Source : Daily Quotations from 1/4/88 - 12/30/88. Research  
Library of the Hong Kong Stock Exchange.

Note : Closing Hang Seng Index is rounded to the nearest digit.

TABLE 3

BUY AND SELL SIGNALS GENERATED BY  
THE "GOLDEN CROSS" METHOD

Type of Signal	Date	Hang Seng Index	Gain/Loss on Transaction
Buy	4 Jan	2286	
Sell	12 Feb	2287	gain 1
Buy	1 Mar	2455	
Sell	16 May	2538	gain 83
Buy	14 Jun	2673	
Sell	9 Aug	2634	loss 39
Buy	17 Oct	2594	
Sell	30 Dec	2687	gain 93
			Total gain 138

- Note :
- 1. Since we cannot sell short in the Hong Kong market, we can only gain on holding long position when the market goes up. We can minimize loss by selling at "Death Cross" but cannot profit by short selling.
  - 2. The position is supposed to be closed at the end of the year 1988.
  - 3. The same assumptions hold for all other methods of interpretation.



TABLE 4

BUY & SELL SIGNALS GENERATED BY THE 10-DAY, 30-DAY & 50-DAY MOVING AVERAGE METHOD

=====									
10-Day			30-Day			50-Day			
Type of Signal	Date	Hang Seng Index		Date	Hang Seng Index		Date	Hang Seng Index	
Buy	1/5	2403		1/5	2403		1/6	2463	
Sell	1/21	2412	+9	2/5	2293	-110	5/23	2490	+27
Buy	1/25	2407		2/15	2302		6/6	2590	
Sell	1/26	2426	+19	2/16	2328	+26	8/11	2395	-195
Buy	1/27	2413		2/29	2418		8/12	2601	
Sell	1/29	2410	-3	3/3	2468	+50	8/18	2571	-30
Buy	2/16	2328		3/8	2493		10/25	2585	
Sell	2/22	2347	+19	4/26	2586	+93	12/30	2678	+102
Buy	2/23	2329		4/28	2588				
Sell	3/24	2546	+217	5/5	2578	-10			
Buy	4/7	2623		5/9	2584				
Sell	4/21	2553	-70	5/17	2534	-50			
Buy	4/29	2603		6/8	2609				
Sell	5/6	2572	-31	7/26	2656	+47			
Buy	5/26	2520		8/2	2701				
Sell	5/27	2514	-6	8/3	2693	-8			
Buy	6/2	2547		9/23	2454				
Sell	6/28	2661	+114	9/27	2466	+12			
Buy	7/6	2738		10/10	2566				
Sell	7/19	2678	-60	12/30	2687	+121			
Buy	8/2	2701							
Sell	8/3	2693	-8						
Buy	8/5	2671							
Sell	8/9	2634	-37						
Buy	8/25	2521							
Sell	8/26	2465	-56						
Buy	9/12	2469							
Sell	9/19	2448	-21						
Buy	10/7	2479							
Sell	11/9	2583	+104						
Buy	11/21	2582							
Sell	12/14	2642	+60						
Buy	12/23	2657							
Sell	12/30	2687	-9						

Total gain for 10-day moving average is +241 index point.  
Total gain for 30-day moving average is +171 index point.  
Total gain for 50-day moving average is -96 index point.

TABLE 5

## MOMENTUM ANALYSIS OF HANG SENG INDEX

Date	Hang Seng Index	% Change From 5 Days Ago	5- Day Mov. Avg.	10-Day Mov. Avg.
04-Jan	2286	-3.91	0.34	5.17
05-Jan	2403	5.07	0.38	4.72
06-Jan	2463	7.04	1.58	4.27
07-Jan	2453	7.02	2.85	4.03
08-Jan	2461	6.86	4.42	3.88
11-Jan	2401	5.03	6.21	3.28
12-Jan	2442	1.62	5.52	2.95
13-Jan	2384	-3.21	3.47	2.52
14-Jan	2412	-1.67	1.73	2.29
15-Jan	2430	-1.26	0.10	2.26
18-Jan	2512	4.62	0.02	3.11
19-Jan	2488	1.88	0.07	2.79
20-Jan	2484	4.19	1.55	2.51
21-Jan	2412	0.00	1.89	1.81
22-Jan	2422	-0.33	2.07	1.09
25-Jan	2407	-4.18	0.31	0.17
26-Jan	2426	-2.49	-0.56	-0.24
27-Jan	2413	-2.86	-1.97	-0.21
28-Jan	2413	0.04	-1.96	-0.04
29-Jan	2410	-0.50	-2.00	0.04
01-Feb	2358	-2.04	-1.57	-0.63
02-Feb	2299	-5.23	-2.12	-1.34
03-Feb	2354	-2.45	-2.03	-2.00
04-Feb	2295	-4.89	-3.02	-2.49
05-Feb	2293	-4.85	-3.89	-2.94
08-Feb	2224	-5.68	-4.62	-3.09
09-Feb	2223	-3.31	-4.24	-3.18
10-Feb	2233	-5.14	-4.77	-3.40
11-Feb	2256	-1.70	-4.14	-3.58
12-Feb	2287	-0.26	-3.22	-3.56
15-Feb	2302	3.51	-1.38	-3.00
16-Feb	2328	4.72	0.23	-2.00
22-Feb	2347	5.11	2.27	-1.25
23-Feb	2329	3.24	3.26	-0.44
24-Feb	2336	2.14	3.74	0.26
25-Feb	2356	2.35	3.51	1.07
26-Feb	2384	2.41	3.05	1.64
29-Feb	2418	3.03	2.63	2.45
01-Mar	2455	5.41	3.07	3.16
02-Mar	2462	5.39	3.72	3.73
03-Mar	2468	4.75	4.20	3.85
04-Mar	2472	3.69	4.45	3.75
07-Mar	2470	2.15	4.28	3.46
08-Mar	2493	1.55	3.51	3.29
09-Mar	2552	3.66	3.16	3.44



TABLE 5 (Continued)

## MOMENTUM ANALYSIS OF HANG SENG INDEX

Date	Hang Seng Index	% Change From 5 Days Ago	5- Day Mov. Avg.	10-Day Mov. Avg.
10-Mar	2591	4.98	3.21	3.70
11-Mar	2595	4.98	3.46	3.96
14-Mar	2585	4.66	3.96	4.12
15-Mar	2579	3.45	4.34	3.93
16-Mar	2555	0.12	3.64	3.40
17-Mar	2581	-0.39	2.56	2.88
18-Mar	2608	0.50	1.67	2.57
21-Mar	2603	0.70	0.88	2.42
22-Mar	2595	0.62	0.31	2.33
23-Mar	2562	0.27	0.34	1.99
24-Mar	2546	-1.36	0.15	1.35
25-Mar	2502	-4.06	-0.77	0.45
28-Mar	2467	-5.22	-1.95	-0.54
29-Mar	2522	-2.81	-2.64	-1.16
30-Mar	2529	-1.29	-2.95	-1.30
31-Mar	2544	-0.08	-2.69	-1.27
06-Apr	2557	2.20	-1.44	-1.10
07-Apr	2623	6.32	0.87	-0.54
08-Apr	2620	3.89	2.21	-0.21
11-Apr	2651	4.82	3.43	0.24
12-Apr	2636	3.62	4.17	0.74
13-Apr	2671	4.46	4.62	1.59
14-Apr	2684	2.33	3.82	2.35
15-Apr	2599	-0.80	2.88	2.55
18-Apr	2552	-3.73	1.17	2.30
19-Apr	2594	-1.59	0.13	2.15
20-Apr	2578	-3.48	-1.46	1.58
21-Apr	2553	-4.88	-2.90	0.46
22-Apr	2591	-0.31	-2.80	0.04
25-Apr	2624	2.82	-1.49	-0.16
26-Apr	2586	-0.31	-1.23	-0.55
27-Apr	2592	0.54	-0.43	-0.94
28-Apr	2588	1.37	0.82	-1.04
29-Apr	2603	0.46	0.98	-0.91
02-May	2590	-1.30	0.15	-0.67
03-May	2603	0.66	0.35	-0.44
04-May	2641	1.89	0.62	0.10
05-May	2578	-0.39	0.27	0.54
06-May	2572	-1.19	-0.07	0.46
09-May	2584	-0.23	0.15	0.15
10-May	2563	-1.54	-0.29	0.03
11-May	2534	-4.05	-1.48	-0.43
12-May	2509	-2.68	-1.94	-0.84
13-May	2533	-1.52	-2.00	-1.03
16-May	2538	-1.78	-2.31	-1.08



TABLE 5 (Continued)

## MOMENTUM ANALYSIS OF HANG SENG INDEX

Date	Hang Seng Index	% Change From 5 Days Ago	5- Day Mov. Avg.	10-Day Mov. Avg.
17-May	2534	-1.13	-2.23	-1.26
18-May	2533	-0.04	-1.43	-1.45
19-May	2507	-0.08	-0.91	-1.42
20-May	2491	-1.66	-0.94	-1.47
23-May	2490	-1.89	-0.96	-1.64
24-May	2516	-0.71	-0.88	-1.55
25-May	2528	-0.20	-0.91	-1.17
26-May	2520	0.52	-0.79	-0.85
27-May	2514	0.92	-0.27	-0.60
30-May	2489	-0.04	0.10	-0.43
31-May	2497	-0.76	0.09	-0.39
01-Jun	2516	-0.47	0.03	-0.44
02-Jun	2547	1.07	0.14	-0.32
03-Jun	2568	2.15	0.39	0.06
06-Jun	2590	4.06	1.21	0.65
07-Jun	2587	3.60	2.08	1.09
08-Jun	2609	3.70	2.92	1.47
09-Jun	2641	3.69	3.44	1.79
10-Jun	2647	3.08	3.63	2.01
14-Jun	2673	3.20	3.45	2.33
15-Jun	2700	4.37	3.61	2.84
16-Jun	2694	3.26	3.52	3.22
17-Jun	2718	2.92	3.36	3.40
20-Jun	2719	2.72	3.29	3.46
21-Jun	2684	0.41	2.73	3.09
22-Jun	2704	0.15	1.89	2.75
23-Jun	2712	0.67	1.37	2.45
24-Jun	2708	-0.37	0.72	2.04
27-Jun	2690	-1.07	-0.04	1.63
28-Jun	2661	-0.86	-0.30	1.22
29-Jun	2648	-2.07	-0.74	0.58
30-Jun	2671	-1.51	-1.17	0.10
01-Jul	2685	-0.85	-1.27	-0.28
04-Jul	2688	-0.07	-1.07	-0.56
05-Jul	2682	0.79	-0.74	-0.52
06-Jul	2738	3.40	0.35	-0.19
07-Jul	2760	3.33	1.32	0.07
08-Jul	2753	2.53	2.00	0.36
11-Jul	2760	2.68	2.55	0.74
12-Jul	2773	3.39	3.07	1.16
13-Jul	2745	0.26	2.44	1.39
14-Jul	2753	-0.25	1.72	1.52
15-Jul	2741	-0.44	1.13	1.56
18-Jul	2711	-1.78	0.24	1.39
19-Jul	2678	-3.43	-1.13	0.97



TABLE 5 (Continued)

## MOMENTUM ANALYSIS OF HANG SENG INDEX

Date	Hang Seng Index	% Change From 5 Days Ago	5- Day Mov. Avg.	10-Day Mov. Avg.
20-Jul	2698	-1.71	-1.52	0.46
21-Jul	2687	-2.40	-1.95	-0.11
22-Jul	2662	-2.88	-2.44	-0.66
25-Jul	2647	-2.36	-2.56	-1.16
26-Jul	2656	-0.82	-2.03	-1.58
27-Jul	2665	-1.22	-1.94	-1.73
28-Jul	2663	-0.89	-1.64	-1.79
29-Jul	2679	0.64	-0.93	-1.69
01-Aug	2703	2.12	-0.04	-1.30
02-Aug	2701	1.69	0.47	-0.78
03-Aug	2693	1.05	0.92	-0.51
04-Aug	2677	0.53	1.20	-0.22
05-Aug	2671	-0.30	1.02	0.04
08-Aug	2659	-1.63	0.27	0.12
09-Aug	2634	-2.48	-0.57	-0.05
10-Aug	2579	-4.23	-1.62	-0.35
11-Aug	2395	-10.53	-3.83	-1.31
12-Aug	2601	-2.62	-4.30	-1.64
15-Aug	2601	-2.18	-4.41	-2.07
16-Aug	2589	-1.71	-4.26	-2.41
17-Aug	2595	0.62	-3.28	-2.45
18-Aug	2571	7.35	0.29	-1.77
19-Aug	2580	-0.81	0.65	-1.82
22-Aug	2564	-1.42	0.81	-1.80
23-Aug	2532	-2.20	0.71	-1.77
24-Aug	2520	-2.89	0.01	-1.64
25-Aug	2521	-1.94	-1.85	-0.78
26-Aug	2465	-4.46	-2.58	-0.96
30-Aug	2440	-4.84	-3.27	-1.23
31-Aug	2444	-3.48	-3.52	-1.41
01-Sep	2433	-3.45	-3.63	-1.81
02-Sep	2450	-2.82	-3.81	-2.83
05-Sep	2508	1.74	-2.57	-2.58
06-Sep	2502	2.54	-1.09	-2.18
07-Sep	2525	3.31	0.27	-1.63
08-Sep	2509	3.12	1.58	-1.03
09-Sep	2497	1.92	2.53	-0.64
12-Sep	2469	-1.56	1.87	-0.35
13-Sep	2474	-1.12	1.14	0.02
14-Sep	2482	-1.70	0.13	0.20
15-Sep	2474	-1.39	-0.77	0.41
16-Sep	2459	-1.52	-1.46	0.53
19-Sep	2448	-0.85	-1.32	0.28
20-Sep	2423	-2.06	-1.51	-0.18
21-Sep	2432	-2.01	-1.57	-0.72



TABLE 5 (Continued)

## MOMENTUM ANALYSIS OF HANG SENG INDEX

Date	Hang Seng Index	% Change From 5 Days Ago	5- Day Mov. Avg.	10-Day Mov. Avg.
22-Sep	2456	-0.73	-1.44	-1.10
23-Sep	2454	-0.20	-1.17	-1.32
27-Sep	2466	0.74	-0.85	-1.09
28-Sep	2450	1.11	-0.22	-0.86
29-Sep	2439	0.29	0.24	-0.66
30-Sep	2441	-0.61	0.26	-0.59
03-Oct	2430	-0.98	0.11	-0.53
04-Oct	2416	-2.03	-0.44	-0.65
05-Oct	2417	-1.35	-0.94	-0.58
06-Oct	2427	-0.49	-1.09	-0.42
07-Oct	2479	1.56	-0.66	-0.20
10-Oct	2566	5.60	0.66	0.38
11-Oct	2572	6.46	2.35	0.96
12-Oct	2552	5.59	3.74	1.40
13-Oct	2562	5.56	4.95	1.93
14-Oct	2593	4.60	5.56	2.45
17-Oct	2594	1.09	4.66	2.66
18-Oct	2590	0.70	3.51	2.93
20-Oct	2584	1.25	2.64	3.19
21-Oct	2582	0.78	1.68	3.32
24-Oct	2562	-1.20	0.53	3.04
25-Oct	2585	-0.35	0.24	2.45
26-Oct	2611	0.81	0.26	1.88
27-Oct	2617	1.28	0.27	1.45
28-Oct	2614	1.24	0.36	1.02
31-Oct	2627	2.54	1.10	0.81
01-Nov	2615	1.16	1.40	0.82
02-Nov	2608	-0.11	1.22	0.74
03-Nov	2584	-1.26	0.71	0.49
04-Nov	2585	-1.11	0.24	0.30
07-Nov	2567	-2.28	-0.72	0.19
08-Nov	2587	-1.07	-1.17	0.12
09-Nov	2583	-0.96	-1.34	-0.06
10-Nov	2577	-0.27	-1.14	-0.21
11-Nov	2584	-0.04	-0.92	-0.34
14-Nov	2538	-1.13	-0.69	-0.71
15-Nov	2569	-0.70	-0.62	-0.89
16-Nov	2567	-0.62	-0.55	-0.94
17-Nov	2569	-0.31	-0.56	-0.85
18-Nov	2581	-0.12	-0.57	-0.75
21-Nov	2582	1.73	0.00	-0.35
22-Nov	2599	1.17	0.37	-0.12
23-Nov	2634	2.61	1.02	0.23
24-Nov	2666	3.78	1.83	0.64
25-Nov	2656	2.91	2.44	0.93



TABLE 5 (Continued)

## MOMENTUM ANALYSIS OF HANG SENG INDEX

Date	Hang Seng Index	% Change From 5 Days Ago	5- Day Mov. Avg.	10-Day Mov. Avg.
28-Nov	2625	1.67	2.42	1.21
29-Nov	2633	1.31	2.45	1.41
30-Nov	2659	0.95	2.12	1.57
01-Dec	2668	0.08	1.38	1.61
02-Dec	2667	0.41	0.88	1.66
05-Dec	2671	1.75	0.90	1.66
06-Dec	2677	1.67	0.97	1.71
07-Dec	2690	1.17	1.02	1.57
08-Dec	2680	0.45	1.09	1.24
09-Dec	2671	0.15	1.04	0.96
12-Dec	2666	-0.19	0.65	0.77
13-Dec	2652	-0.93	0.13	0.55
14-Dec	2642	-1.78	-0.46	0.28
15-Dec	2627	-1.98	-0.95	0.07
16-Dec	2629	-1.57	-1.29	-0.13
19-Dec	2612	-2.03	-1.66	-0.50
20-Dec	2608	-1.66	-1.80	-0.84
21-Dec	2633	-0.34	-1.52	-0.99
22-Dec	2643	0.61	-1.00	-0.97
23-Dec	2657	1.07	-0.47	-0.88
28-Dec	2696	3.22	0.58	-0.54
29-Dec	2692	3.22	1.55	-0.12
30-Dec	2687	2.05	2.03	0.26

Source : Daily Quotations from 1/4/88 - 12/30/88. Research  
Library of the Hong Kong Stock Exchange.

Note : Closing Hang Seng Index is rounded to the nearest digit.

TABLE 6

## BUY &amp; SELL SIGNALS GENERATED BY THE MOMENTUM METHOD

5-day Mov. Avg. Method				10-day Mov. Avg. Method		
Type of Signal	Date	Hang Seng Index	Gain/ Loss	Date	Hang Seng Index	Gain/ Loss
Buy	1/5	2403		1/11	2401	
Sell	1/15	2430	+ 27	1/25	2407	+ 6
Buy	1/18	2512		1/28	2413	
Sell	1/25	2407	-105	1/29	2410	-3
Buy	2/16	2328		2/23	2329	
Sell	3/24	2546	+ 218	3/25	2502	+18
Buy	4/7	2623		4/7	2623	
Sell	4/19	2594	-29	4/21	2553	-70
Buy	4/27	2592		4/25	2624	
Sell	5/2	2590	-2	4/26	2586	-38
Buy	5/3	2603		4/29	2603	
Sell	5/5	2578	-25	5/2	2590	-13
Buy	6/2	2547		5/3	2603	
Sell	6/24	2708	+ 161	5/5	2578	-25
Buy	7/5	2682		6/2	2547	
Sell	7/18	2711	+ 29	6/29	2648	+11
Buy	7/29	2679		7/7	2760	
Sell	8/8	2659	-20	7/20	2698	-62
Buy	8/18	2571		8/2	2701	
Sell	8/19	2580	+ 9	8/5	2671	-30
Buy	9/7	2525		9/9	2497	
Sell	9/14	2482	-43	9/12	2469	-28
Buy	9/27	2466		9/28	2450	
Sell	9/30	2441	-25	9/30	2441	-9
Buy	10/7	2479		10/10	2566	
Sell	10/24	2562	+ 83	11/2	2608	+42
Buy	10/26	2611		11/21	2582	
Sell	11/2	2608	-3	12/12	2666	+84
Buy	11/21	2582		12/23	2657	
Sell	12/12	2666	+ 84	12/30	2687	+30
Buy	12/23	2657				
Sell	12/30	2687	+ 30			

Total gain for 5-day moving average method is +389 index points.  
 Total gain for 10-day moving average method is +158 index points.



TABLE 7

## DIFFUSION INDEX OF ADVANCING ISSUES ON HKSE

Date	Hang Seng Index	Daily Advance	Daily Decline	% Advanced	3-Day Mov. Avg.
04-Jan	2286	39	169	18.8	53.9
05-Jan	2403	232	27	89.6	58.5
06-Jan	2463	172	71	70.8	59.7
07-Jan	2453	94	143	39.7	66.7
08-Jan	2461	125	99	55.8	55.4
11-Jan	2401	18	222	7.5	34.3
12-Jan	2442	159	54	74.6	46.0
13-Jan	2384	21	219	8.8	30.3
14-Jan	2412	147	70	67.7	50.4
15-Jan	2430	134	84	61.5	46.0
18-Jan	2512	221	29	88.4	72.5
19-Jan	2488	75	162	31.6	60.5
20-Jan	2484	105	112	48.4	56.1
21-Jan	2412	14	221	6.0	28.7
22-Jan	2422	100	98	50.5	34.9
25-Jan	2407	38	190	16.7	24.4
26-Jan	2426	104	96	52.0	39.7
27-Jan	2413	59	124	32.2	33.6
28-Jan	2413	92	100	47.9	44.1
29-Jan	2410	101	99	50.5	43.6
01-Feb	2358	21	224	8.6	35.7
02-Feb	2299	25	195	11.4	23.5
03-Feb	2354	191	35	84.5	34.8
04-Feb	2295	23	207	10.0	35.3
05-Feb	2293	99	82	54.7	49.7
08-Feb	2224	8	215	3.6	22.8
09-Feb	2223	99	78	55.9	38.1
10-Feb	2233	132	58	69.5	43.0
11-Feb	2256	130	56	69.9	65.1
12-Feb	2287	164	31	84.1	74.5
15-Feb	2302	128	63	67.0	73.7
16-Feb	2328	157	21	88.2	79.8
22-Feb	2347	165	46	78.2	77.8
23-Feb	2329	66	144	31.4	65.9
24-Feb	2336	92	93	49.7	53.1
25-Feb	2356	158	50	76.0	52.4
26-Feb	2384	197	48	80.4	68.7
29-Feb	2418	209	40	83.9	80.1
01-Mar	2455	180	55	76.6	80.3
02-Mar	2462	104	104	50.0	70.2
03-Mar	2468	115	99	53.7	60.1
04-Mar	2472	166	63	72.5	58.7
07-Mar	2470	161	70	69.7	65.3
08-Mar	2493	137	93	59.6	67.3
09-Mar	2552	225	40	84.9	71.4



TABLE 7 (Continued)

## DIFFUSION INDEX OF ADVANCING ISSUES ON HKSE

Date	Hang Seng Index	Daily Advance	Daily Decline	% Advanced	3-Day Mov. Avg.
10-Mar	2591	149	91	62.1	68.9
11-Mar	2595	108	142	43.2	63.4
14-Mar	2585	128	117	52.2	52.5
15-Mar	2579	130	104	55.6	50.3
16-Mar	2555	99	125	44.2	50.7
17-Mar	2581	192	66	74.4	58.1
18-Mar	2608	167	75	69.0	62.5
21-Mar	2603	148	90	62.2	68.5
22-Mar	2595	101	121	45.5	58.9
23-Mar	2562	58	209	21.7	43.1
24-Mar	2546	38	211	15.3	27.5
25-Mar	2502	21	245	7.9	15.0
28-Mar	2467	31	199	13.5	12.2
29-Mar	2522	230	32	87.8	36.4
30-Mar	2529	159	69	69.7	57.0
31-Mar	2544	195	41	82.6	80.1
06-Apr	2557	165	60	73.3	75.2
07-Apr	2623	232	38	85.9	80.6
08-Apr	2620	132	119	52.6	70.6
11-Apr	2651	217	45	82.8	73.8
12-Apr	2636	161	114	58.5	64.7
13-Apr	2671	233	43	84.4	75.3
14-Apr	2684	137	126	52.1	65.0
15-Apr	2599	9	281	3.1	46.5
18-Apr	2552	42	232	15.3	23.5
19-Apr	2594	224	46	83.0	33.8
20-Apr	2578	122	109	52.8	50.4
21-Apr	2553	54	196	21.6	52.5
22-Apr	2591	247	30	89.2	54.5
25-Apr	2624	251	24	91.3	67.3
26-Apr	2586	96	179	34.9	71.8
27-Apr	2592	139	94	59.7	61.9
28-Apr	2588	106	132	44.5	46.4
29-Apr	2603	182	54	77.1	60.4
02-May	2590	137	112	55.0	58.9
03-May	2603	181	59	75.4	69.2
04-May	2641	239	44	84.5	71.6
05-May	2578	18	274	6.2	55.3
06-May	2572	143	87	62.2	50.9
09-May	2584	123	119	50.8	39.7
10-May	2563	47	192	19.7	44.2
11-May	2534	33	241	12.0	27.5
12-May	2509	25	247	9.2	13.6
13-May	2533	231	34	87.2	36.1
16-May	2538	123	97	55.9	50.8



TABLE 7 (Continued)

## DIFFUSION INDEX OF ADVANCING ISSUES ON HKSE

Date	Hang Seng Index	Daily Advance	Daily Decline	% Advanced	3-Day Mov. Avg.
17-May	2534	108	101	51.7	64.9
18-May	2533	130	74	63.7	57.1
19-May	2507	30	241	11.1	42.2
20-May	2491	62	149	29.4	34.7
23-May	2490	94	102	48.0	29.5
24-May	2516	214	40	84.3	53.9
25-May	2528	172	77	69.1	67.1
26-May	2520	112	115	49.3	67.6
27-May	2514	135	101	57.2	58.5
30-May	2489	69	183	27.4	44.6
31-May	2497	102	113	47.4	44.0
01-Jun	2516	206	46	81.7	52.2
02-Jun	2547	242	45	84.3	71.2
03-Jun	2568	179	70	71.9	79.3
06-Jun	2590	236	52	81.9	79.4
07-Jun	2587	109	150	42.1	65.3
08-Jun	2609	225	57	79.8	67.9
09-Jun	2641	213	69	75.5	65.8
10-Jun	2647	169	101	62.6	72.6
14-Jun	2673	181	87	67.5	68.6
15-Jun	2700	144	114	55.8	62.0
16-Jun	2694	115	141	44.9	56.1
17-Jun	2718	194	61	76.1	58.9
20-Jun	2719	151	120	55.7	58.9
21-Jun	2684	45	222	16.9	49.6
22-Jun	2704	225	51	81.5	51.4
23-Jun	2712	132	130	50.4	49.6
24-Jun	2708	133	113	54.1	62.0
27-Jun	2690	95	185	33.9	46.1
28-Jun	2661	39	241	13.9	34.0
29-Jun	2648	38	245	13.4	20.4
30-Jun	2671	212	49	81.2	36.2
01-Jul	2685	143	92	60.9	51.8
04-Jul	2688	109	142	43.4	61.8
05-Jul	2682	59	187	24.0	42.8
06-Jul	2738	262	24	91.6	53.0
07-Jul	2760	120	139	46.3	54.0
08-Jul	2753	118	122	49.2	62.4
11-Jul	2760	118	121	49.4	48.3
12-Jul	2773	140	116	54.7	51.1
13-Jul	2745	88	168	34.4	46.1
14-Jul	2753	112	134	45.5	44.9
15-Jul	2741	61	204	23.0	34.3
18-Jul	2711	39	229	14.6	27.7
19-Jul	2678	23	253	8.3	15.3



TABLE 7 (Continued)

## DIFFUSION INDEX OF ADVANCING ISSUES ON HKSE

Date	Hang Seng Index	Daily Advance	Daily Decline	% Advanced	3-Day Mov. Avg.
20-Jul	2698	214	43	83.3	35.4
21-Jul	2687	109	138	44.1	45.2
22-Jul	2662	45	226	16.6	48.0
25-Jul	2647	67	157	29.9	30.2
26-Jul	2656	111	124	47.2	31.2
27-Jul	2665	153	58	72.5	49.9
28-Jul	2663	93	138	40.3	53.3
29-Jul	2679	189	46	80.4	64.4
01-Aug	2703	204	58	77.9	66.2
02-Aug	2701	75	162	31.6	63.3
03-Aug	2693	68	183	27.1	45.5
04-Aug	2677	27	243	10.0	22.9
05-Aug	2671	171	67	71.8	36.3
08-Aug	2659	46	210	18.0	33.3
09-Aug	2634	20	238	7.8	32.5
10-Aug	2579	6	295	2.0	9.2
11-Aug	2395	146	96	60.3	23.4
12-Aug	2601	138	81	63.0	41.8
15-Aug	2601	57	162	26.0	49.8
16-Aug	2589	129	94	57.8	49.0
17-Aug	2595	180	67	72.9	52.2
18-Aug	2571	33	233	12.4	47.7
19-Aug	2580	135	66	67.2	50.8
22-Aug	2564	47	180	20.7	33.4
23-Aug	2532	25	196	11.3	33.1
24-Aug	2520	60	161	27.1	19.7
25-Aug	2521	72	147	32.9	23.8
26-Aug	2465	10	264	3.6	21.2
30-Aug	2440	29	191	13.2	16.6
31-Aug	2444	149	85	63.7	26.8
01-Sep	2433	40	176	18.5	31.8
02-Sep	2450	215	32	87.0	56.4
05-Sep	2508	262	24	91.6	65.7
06-Sep	2502	134	82	62.0	80.2
07-Sep	2525	189	57	76.8	76.8
08-Sep	2509	52	197	20.9	53.2
09-Sep	2497	53	182	22.6	40.1
12-Sep	2469	28	240	10.4	18.0
13-Sep	2474	111	88	55.8	29.6
14-Sep	2482	120	84	58.8	41.7
15-Sep	2474	54	176	23.5	46.0
16-Sep	2459	27	218	11.0	31.1
19-Sep	2448	37	163	18.5	17.7
20-Sep	2423	29	205	12.4	14.0
21-Sep	2432	140	63	69.0	33.3



TABLE 7 (Continued)

## DIFFUSION INDEX OF ADVANCING ISSUES ON HKSE

Date	Hang Seng Index	Daily Advance	Daily Decline	% Advanced	3-Day Mov. Avg.
22-Sep	2456	147	68	68.4	49.9
23-Sep	2454	100	102	49.5	62.3
27-Sep	2466	120	68	63.8	60.6
28-Sep	2450	30	178	14.4	42.6
29-Sep	2439	36	161	18.3	32.2
30-Sep	2441	90	109	45.2	26.0
03-Oct	2430	21	194	9.8	24.4
04-Oct	2416	21	216	8.9	21.3
05-Oct	2417	132	83	61.4	26.7
06-Oct	2427	174	48	78.4	49.5
07-Oct	2479	262	17	93.9	77.9
10-Oct	2566	304	9	97.1	89.8
11-Oct	2572	116	136	46.0	79.0
12-Oct	2552	81	182	30.8	58.0
13-Oct	2562	105	112	48.4	41.7
14-Oct	2593	206	50	80.5	53.2
17-Oct	2594	111	126	46.8	58.6
18-Oct	2590	123	110	52.8	60.0
20-Oct	2584	98	131	42.8	47.5
21-Oct	2582	111	125	47.0	47.5
24-Oct	2562	20	216	8.5	32.8
25-Oct	2585	203	49	80.6	45.4
26-Oct	2611	167	70	70.5	53.2
27-Oct	2617	92	138	40.0	63.7
28-Oct	2614	99	131	43.0	51.2
31-Oct	2627	161	81	66.5	49.9
01-Nov	2615	58	181	24.3	44.6
02-Nov	2608	74	141	34.4	41.7
03-Nov	2584	27	242	10.0	22.9
04-Nov	2585	130	83	61.0	35.2
07-Nov	2567	46	197	18.9	30.0
08-Nov	2587	191	46	80.6	53.5
09-Nov	2583	106	134	44.2	47.9
10-Nov	2577	85	116	42.3	55.7
11-Nov	2584	148	71	67.6	51.3
14-Nov	2538	22	248	8.1	39.3
15-Nov	2569	180	46	79.6	51.8
16-Nov	2567	111	114	49.3	45.7
17-Nov	2569	97	117	45.3	58.1
18-Nov	2581	151	86	63.7	52.8
21-Nov	2582	136	105	56.4	55.2
22-Nov	2599	161	87	64.9	61.7
23-Nov	2634	173	80	68.4	63.2
24-Nov	2666	222	56	79.9	71.1
25-Nov	2656	116	126	47.9	65.4

TABLE 7 (Continued)

## DIFFUSION INDEX OF ADVANCING ISSUES ON HKSE

Date	Hang Seng Index	Daily Advance	Daily Decline	% Advanced	3-Day Mov. Avg.
28-Nov	2625	75	184	29.0	52.2
29-Nov	2633	164	73	69.2	48.7
30-Nov	2659	199	76	72.4	56.8
01-Dec	2668	109	155	41.3	60.9
02-Dec	2667	134	108	55.4	56.3
05-Dec	2671	124	127	49.4	48.7
06-Dec	2677	102	148	40.8	48.5
07-Dec	2690	133	128	51.0	47.1
08-Dec	2680	59	203	22.5	38.1
09-Dec	2671	122	101	54.7	42.7
12-Dec	2666	110	112	49.5	42.3
13-Dec	2652	53	162	24.7	43.0
14-Dec	2642	86	141	37.9	37.4
15-Dec	2627	44	206	17.6	26.7
16-Dec	2629	106	93	53.3	36.3
19-Dec	2612	38	225	14.4	28.4
20-Dec	2608	107	112	48.9	38.9
21-Dec	2633	175	49	78.1	47.1
22-Dec	2643	116	101	53.5	60.1
23-Dec	2657	153	68	69.2	66.9
28-Dec	2696	177	91	66.0	62.9
29-Dec	2692	93	152	38.0	57.7
30-Dec	2687	166	80	67.5	57.2

Source : Daily Quotations from 1/4/88 - 12/30/88. Research  
Library of the Hong Kong Stock Exchange.

Note : Closing Hang Seng Index is rounded to the nearest digit.



TABLE 8

BUY & SELL SIGNALS GENERATED  
BY THE DIFFUSION INDEX METHOD

Type of Signal	Date	Hang Seng Index	Gain/ Loss
Buy	2/5	2293	
Sell	3/25	2502	+ 209
Buy	3/30	2529	
Sell	4/18	2552	+ 23
Buy	4/22	2591	
Sell	5/9	2584	-7
Buy	5/17	2534	
Sell	5/20	2491	-43
Buy	5/25	2528	
Sell	6/28	2661	+ 133
Buy	7/4	2688	
Sell	7/15	2741	+ 53
Buy	7/29	2679	
Sell	8/4	2677	-2
Buy	8/17	2595	
Sell	8/23	2532	-63
Buy	9/5	2508	
Sell	9/13	2474	-34
Buy	9/27	2466	
Sell	9/30	2441	-25
Buy	10/10	2566	
Sell	10/24	2562	-4
Buy	10/27	2617	
Sell	11/2	2608	-9
Buy	11/10	2577	
Sell	12/8	2680	+ 103
Buy	12/22	2643	
Sell	12/30	2687	+ 44

The total gain using this diffusion index method is +378 index points.

Table 9

AVERAGE DAILY VOLUME AND ITS 3-DAY AND  
10-DAY MOVING AVERAGES

Date	Hang Seng Index	Average Daily Volume in mil. Share	3-Day Mov. Avg.	10-Day Mov. Avg.
04-Jan	2286	319	298.7	367.8
05-Jan	2403	453	352.0	377.3
06-Jan	2463	632	468.0	386.8
07-Jan	2453	552	545.7	396.3
08-Jan	2461	476	553.3	408.3
11-Jan	2401	420	482.7	414.2
12-Jan	2442	319	405.0	406.1
13-Jan	2384	308	349.0	405.6
14-Jan	2412	248	291.7	401.1
15-Jan	2430	200	252.0	392.7
18-Jan	2512	485	311.0	409.3
19-Jan	2488	297	327.3	393.7
20-Jan	2484	286	356.0	359.1
21-Jan	2412	314	299.0	335.3
22-Jan	2422	277	292.3	315.4
25-Jan	2407	209	266.7	294.3
26-Jan	2426	213	233.0	283.7
27-Jan	2413	166	196.0	269.5
28-Jan	2413	183	187.3	263.0
29-Jan	2410	242	197.0	267.2
01-Feb	2358	266	230.3	245.3
02-Feb	2299	217	241.7	237.3
03-Feb	2354	217	233.3	230.4
04-Feb	2295	190	208.0	218.0
05-Feb	2293	199	202.0	210.2
08-Feb	2224	220	203.0	211.3
09-Feb	2223	172	197.0	207.2
10-Feb	2233	156	182.7	206.2
11-Feb	2256	195	174.3	207.4
12-Feb	2287	218	189.7	205.0
15-Feb	2302	161	191.3	194.5
16-Feb	2328	132	170.3	186.0
22-Feb	2347	199	164.0	184.2
23-Feb	2329	194	175.0	184.6
24-Feb	2336	162	185.0	180.9
25-Feb	2356	203	186.3	179.2
26-Feb	2384	325	230.0	194.5
29-Feb	2418	458	328.7	224.7
01-Mar	2455	520	434.3	257.2
02-Mar	2462	432	470.0	278.6
03-Mar	2468	378	443.3	300.3
04-Mar	2472	454	421.3	332.5
07-Mar	2470	536	456.0	366.2
08-Mar	2493	431	473.7	389.9



Table 9 (Continued)

AVERAGE DAILY VOLUME AND ITS 3-DAY AND  
10-DAY MOVING AVERAGES

Date	Hang Seng Index	Average Daily Volume in mil. Share	3-Day Mov. Avg.	10-Day Mov. Avg.
09-Mar	2552	600	522.3	433.7
10-Mar	2591	740	590.3	487.4
11-Mar	2595	656	665.3	520.5
14-Mar	2585	711	702.3	545.8
15-Mar	2579	588	651.7	552.6
16-Mar	2555	534	611.0	562.8
17-Mar	2581	725	615.7	597.5
18-Mar	2608	825	694.7	634.6
21-Mar	2603	620	723.3	643.0
22-Mar	2595	607	684.0	660.6
23-Mar	2562	653	626.7	665.9
24-Mar	2546	441	567.0	636.0
25-Mar	2502	568	554.0	627.2
28-Mar	2467	353	454.0	591.4
29-Mar	2522	406	442.3	573.2
30-Mar	2529	441	400.0	563.9
31-Mar	2544	346	397.7	526.0
06-Apr	2557	374	387.0	480.9
07-Apr	2623	686	468.7	487.5
08-Apr	2620	678	579.3	494.6
11-Apr	2651	643	669.0	493.6
12-Apr	2636	758	693.0	525.3
13-Apr	2671	725	708.7	541.0
14-Apr	2684	751	744.7	580.8
15-Apr	2599	788	754.7	619.0
18-Apr	2552	523	687.3	627.2
19-Apr	2594	403	571.3	632.9
20-Apr	2578	481	469.0	643.6
21-Apr	2553	393	425.7	614.3
22-Apr	2591	419	431.0	588.4
25-Apr	2624	599	470.3	584.0
26-Apr	2586	881	633.0	596.3
27-Apr	2592	570	683.3	580.8
28-Apr	2588	713	721.3	577.0
29-Apr	2603	560	614.3	554.2
02-May	2590	469	580.7	548.8
03-May	2603	556	528.3	564.1
04-May	2641	847	624.0	600.7
05-May	2578	684	695.7	629.8
06-May	2572	600	710.3	647.9
09-May	2584	460	581.3	634.0
10-May	2563	436	498.7	589.5
11-May	2534	498	464.7	582.3
12-May	2509	560	498.0	567.0



Table 9 (Continued)

AVERAGE DAILY VOLUME AND ITS 3-DAY AND  
10-DAY MOVING AVERAGES

Date	Hang Seng Index	Average Daily Volume in mil. Share	3-Day Mov. Avg.	10-Day Mov. Avg.
13-May	2533	411	489.7	552.1
16-May	2538	368	446.3	542.0
17-May	2534	329	369.3	519.3
18-May	2533	378	358.3	472.4
19-May	2507	484	397.0	452.4
20-May	2491	444	435.3	436.8
23-May	2490	286	404.7	419.4
24-May	2516	432	387.3	419.0
25-May	2528	459	392.3	415.1
26-May	2520	550	480.3	414.1
27-May	2514	540	516.3	427.0
30-May	2489	331	473.7	423.3
31-May	2497	302	391.0	420.6
01-Jun	2516	583	405.3	441.1
02-Jun	2547	726	537.0	465.3
03-Jun	2568	830	713.0	503.9
06-Jun	2590	908	821.3	566.1
07-Jun	2587	765	834.3	599.4
08-Jun	2609	901	858.0	643.6
09-Jun	2641	1338	1001.3	722.4
10-Jun	2647	1250	1163.0	793.4
14-Jun	2673	1074	1220.7	867.7
15-Jun	2700	1137	1153.7	951.2
16-Jun	2694	953	1054.7	988.2
17-Jun	2718	1200	1096.7	1035.6
20-Jun	2719	1345	1166.0	1087.1
21-Jun	2684	1003	1182.7	1096.6
22-Jun	2704	1177	1175.0	1137.8
23-Jun	2712	1066	1082.0	1154.3
24-Jun	2708	923	1055.3	1112.8
27-Jun	2690	972	987.0	1085.0
28-Jun	2661	749	881.3	1052.5
29-Jun	2648	916	879.0	1030.4
30-Jun	2671	614	759.7	996.5
01-Jul	2685	739	756.3	950.4
04-Jul	2688	563	638.7	872.2
05-Jul	2682	395	565.7	811.4
06-Jul	2738	559	505.7	749.6
07-Jul	2760	501	485.0	693.1
08-Jul	2753	533	531.0	654.1
11-Jul	2760	495	509.7	606.4
12-Jul	2773	664	564.0	597.9
13-Jul	2745	596	585.0	565.9
14-Jul	2753	558	606.0	560.3



Table 9 (Continued)

AVERAGE DAILY VOLUME AND ITS 3-DAY AND  
10-DAY MOVING AVERAGES

Date	Hang Seng Index	Average Daily Volume in mil. Share	3-Day Mov. Avg.	10-Day Mov. Avg.
15-Jul	2741	507	553.7	537.1
18-Jul	2711	475	513.3	528.3
19-Jul	2678	458	480.0	534.6
20-Jul	2698	440	457.7	522.7
21-Jul	2687	359	419.0	508.5
22-Jul	2662	378	392.3	493.0
25-Jul	2647	366	367.7	480.1
26-Jul	2656	356	366.7	449.3
27-Jul	2665	320	347.3	421.7
28-Jul	2663	332	336.0	399.1
29-Jul	2679	443	365.0	392.7
01-Aug	2703	535	436.7	398.7
02-Aug	2701	389	455.7	391.8
03-Aug	2693	337	420.3	381.5
04-Aug	2677	380	368.7	383.6
05-Aug	2671	366	361.0	382.4
08-Aug	2659	353	366.3	381.1
09-Aug	2634	413	377.3	386.8
10-Aug	2579	445	403.7	399.3
11-Aug	2395	464	440.7	412.5
12-Aug	2601	316	408.3	399.8
15-Aug	2601	242	340.7	370.5
16-Aug	2589	320	292.7	363.6
17-Aug	2595	406	322.7	370.5
18-Aug	2571	353	359.7	367.8
19-Aug	2580	251	336.7	356.3
22-Aug	2564	214	272.7	342.4
23-Aug	2532	244	236.3	325.5
24-Aug	2520	239	232.3	304.9
25-Aug	2521	289	257.3	287.4
26-Aug	2465	424	317.3	298.2
30-Aug	2440	350	354.3	309.0
31-Aug	2444	276	350.0	304.6
01-Sep	2433	286	304.0	292.6
02-Sep	2450	419	327.0	299.2
05-Sep	2508	698	467.7	343.9
06-Sep	2502	534	550.3	375.9
07-Sep	2525	714	648.7	422.9
08-Sep	2509	695	647.7	468.5
09-Sep	2497	465	624.7	486.1
12-Sep	2469	349	503.0	478.6
13-Sep	2474	369	394.3	480.5
14-Sep	2482	341	353.0	487.0
15-Sep	2474	399	369.7	498.3



Table 9 (Continued)

AVERAGE DAILY VOLUME AND ITS 3-DAY AND  
10-DAY MOVING AVERAGES

Date	Hang Seng Index	Average Daily Volume in mil. Share	3-Day Mov. Avg.	10-Day Mov. Avg.
16-Sep	2459	375	371.7	493.9
19-Sep	2448	216	330.0	445.7
20-Sep	2423	248	279.7	417.1
21-Sep	2432	260	241.3	371.7
22-Sep	2456	375	294.3	339.7
23-Sep	2454	236	290.3	316.8
27-Sep	2466	205	272.0	302.4
28-Sep	2450	256	232.3	291.1
29-Sep	2439	231	230.7	280.1
30-Sep	2441	333	273.3	273.5
03-Oct	2430	260	274.7	262.0
04-Oct	2416	279	290.7	268.3
05-Oct	2417	303	280.7	273.8
06-Oct	2427	376	319.3	285.4
07-Oct	2479	620	433.0	309.9
10-Oct	2566	904	633.3	376.7
11-Oct	2572	718	747.3	428.0
12-Oct	2552	516	712.7	454.0
13-Oct	2562	445	559.7	475.4
14-Oct	2593	502	487.7	492.3
17-Oct	2594	454	467.0	511.7
18-Oct	2590	380	445.3	521.8
20-Oct	2584	440	424.7	535.5
21-Oct	2582	476	432.0	545.5
24-Oct	2562	299	405.0	513.4
25-Oct	2585	337	370.7	456.7
26-Oct	2611	459	365.0	430.8
27-Oct	2617	485	427.0	427.7
28-Oct	2614	395	446.3	422.7
31-Oct	2627	526	468.7	425.1
01-Nov	2615	529	483.3	432.6
02-Nov	2608	417	490.7	436.3
03-Nov	2584	379	441.7	430.2
04-Nov	2585	381	392.3	420.7
07-Nov	2567	297	352.3	420.5
08-Nov	2587	250	309.3	411.8
09-Nov	2583	398	315.0	405.7
10-Nov	2577	318	322.0	389.0
11-Nov	2584	367	361.0	386.2
14-Nov	2538	278	321.0	361.4
15-Nov	2569	362	335.7	344.7
16-Nov	2567	396	345.3	342.6
17-Nov	2569	293	350.3	334.0
18-Nov	2581	379	356.0	333.8



Table 9 (Continued)

AVERAGE DAILY VOLUME AND ITS 3-DAY AND  
10-DAY MOVING AVERAGES

Date	Hang Seng Index	Average Daily Volume in mil. Share	3-Day Mov. Avg.	10-Day Mov. Avg.
21-Nov	2582	515	395.7	355.6
22-Nov	2599	593	495.7	389.9
23-Nov	2634	669	592.3	417.0
24-Nov	2666	828	696.7	468.0
25-Nov	2656	784	760.3	509.7
28-Nov	2625	544	718.7	536.3
29-Nov	2633	535	621.0	553.6
30-Nov	2659	841	640.0	598.1
01-Dec	2668	748	708.0	643.6
02-Dec	2667	598	729.0	665.5
05-Dec	2671	710	685.3	685.0
06-Dec	2677	538	615.3	679.5
07-Dec	2690	548	598.7	667.4
08-Dec	2680	419	501.7	626.5
09-Dec	2671	409	458.7	589.0
12-Dec	2666	389	405.7	573.5
13-Dec	2652	354	384.0	555.4
14-Dec	2642	332	358.3	504.5
15-Dec	2627	328	338.0	462.5
16-Dec	2629	317	325.7	434.4
19-Dec	2612	279	308.0	391.3
20-Dec	2608	303	299.7	367.8
21-Dec	2633	293	291.7	342.3
22-Dec	2643	366	320.7	337.0
23-Dec	2657	270	309.7	323.1
28-Dec	2696	351	329.0	319.3
29-Dec	2692	517	379.3	335.6
30-Dec	2687	579	482.3	360.3

Source : Daily Quotations from 1/4/88 - 12/30/88. Research  
Library of the Hong Kong Stock Exchange.

Note : Closing Hang Seng Index is rounded to the nearest digit.

TABLE 10

BUY & SELL SIGNALS GENERATED BY THE VOLUME METHOD

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Type of Signal	Date	Hang Seng Index	Gain/Loss	Date	Hang Seng Index	Gain/ Loss
3-day method			10-day method			
Buy	1/11	2401		1/19	2488	-78
Sell	1/29	2410	+ 9	1/29	2410	
Buy	2/12	2287		2/2	2299	
Sell	2/16	2328	+ 41	2/12	2287	-12
Buy	2/23	2329		2/26	2384	
Sell	3/3	2468	+ 139	4/12	2636	+22
Buy	3/15	2579		4/21	2553	
Sell	4/29	2603	+ 24	4/27	2592	+39
Buy	5/4	2641		5/3	2603	
Sell	5/9	2584	-57	5/9	2584	-19
Buy	5/23	2490		5/30	2489	
Sell	6/15	2700	+ 210	7/20	2698	+20
Buy	6/24	2708		8/2	2701	
Sell	8/8	2659	-49	8/9	2634	-67
Buy	8/17	2595		8/18	2571	
Sell	8/19	2580	-15	8/26	2465	-106
Buy	8/25	2521		9/2	2450	
Sell	8/31	2444	-77	10/4	2416	-34
Buy	9/2	2450		10/24	2562	
Sell	9/15	2474	+ 24	12/6	2677	+115
Buy	9/19	2448				
Sell	11/9	2583	+ 135			
Buy	11/15	2569				
Sell	12/5	2671	+ 102			
Buy	12/28	2696				
Sell	12/30	2687	-9			

The total gain for the 3-day moving average volume method is +477 index points.  
The total gain for the 10-day moving average volume method is +299 index points.



CHAPTER VI

CONCLUSION

Summary of Results And Findings

The results and findings of the use of those technical analysis methods are summarized in table 11.

TABLE 11

SUMMARY OF RESULTS USING VARIOUS TECHNICAL INDICATORS

Technical Indicators		Total gain Index	% of B-&-H	No. of Transaction gain	Transaction loss	total
Moving Average	Confirmation by 30-day & 50-day moving average	284	71%	1	0	1
	Golden Cross	138	34%	3	1	4
	10-day	241	60%	7	10	17
	30-day	171	43%	5	4	9
	50-day	-96	0%	2	2	4
Momentum	5-day	389	97%	8	8	16
	10-day	158	39%	6	9	15
Diffusion Index		378	94%	6	8	14
Volume	3-day	477	119%	8	5	13
	10-day	299	75%	4	6	10

Note: The gain of the simple Buy-and-Hold strategy for the period is 401 index points.

In general, the Technical Analysis Technique does not seem to generate handsome profits for investors. In fact, all of the four method employed (with the exception of 3-day moving average of volume analysis) perform worse than the simple Buy-and-Hold strategy. Thus, those technical methods are still subjected to modification before they could be profitably used for successful trading. It is plausible that the volume method could be the method particularly suitable for the Hong Kong Stock Market although more vigorous and detailed study on this method alone is required before final conclusion can be made.

However, it could be seen that many of the technical methods are indeed capable of capturing many of the major upward short/intermediate movements. For an overview of the general trend of the Hang Seng Index for the study period, please see figure 2. As could be seen from the figure, the trend went up steeply for 4 times (February 15, March 31, May 30 and September 28) and most technical indicators can capture them successfully.

However, we still see a rather big discrepancies among the results of employing different technical methods. The problem is that in many cases the technical indicators emit signals for buying and selling which result in trading loss. It could be seen that the 3-day moving average Volume method (which performs better than the Buy-&-Hold strategy) provides much fewer loss signals than the other methods. It is understandable that trading resulting in a loss is even worse than failing to capture a profitable transaction and this should be minimized. Some refined trading methods to eliminate such problem is given in the next recommendation section. The result of the analysis in the above sections also



Figure 2: Daily Closing Hang Seng Index



indicates that accurate timing of buy or sell signals is necessary for profitable trading. Accurate timing of buy and sell signals would enable each trading transaction to capture the whole instead of just part of the market movement. Indicators (e.g. 30-day or 50-day moving averages of Hang Seng Index) which are relatively late in identifying upward or downward trend would not be able provide such profitable trading.

### Recommendation and Guidelines For the Use of Technical Analysis Method

The most important argument to support the use of technical analysis is probably summarized by Leo Liu in his article.<sup>13</sup> He mentions that individuals, as a semi-professional of the underlying stocks, will not know the real supply and demand situation of the stock market until it is too late. Thus, it would be better to let the price movements moulded by the leaders to help them to trade.

It have been shown through the above analysis that only some of the Technical Analysis Techniques are satisfactory in forecasting the overall market trend of the Hong Kong Stock Market. However, in the case of choosing individual stocks for investing, this method would have to be supplemented with the fundamental analysis for stocks since it is virtually impossible to perform technical analysis methods on each and every individual security. Yet, with a sufficiently diversified portfolio which considerably reduced the diversifiable risks of individual stocks, the beta of the portfolio is a very useful way of relating this portfolio performance to the stock market as a whole. If we discover the market

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13

Leo Liu, "What is Investment - A Candid View" in CUMBA Evolution 1966-1988. p.56.



is going to turn upward after going through technical analysis, we can construct a portfolio with high beta so that the gain through the overall market movement can be maximized. In other words, technical analysis is useful in studying the overall market trend and in timing the purchase/sale of stocks.

However, in the above empirical study, we have not taken into the account of the transaction costs involved in all the trading. More number of trading obviously means more brokerage commission and larger loss in the bid/ask spreads. Yet, if there are more transactions involved, it is likely the cost for each transaction would actually be lower (especially for the case of large investors). Therefore, transaction costs may only be a secondary consideration if the trading profit is shown to be enough to cover such costs. Also, in the above analysis, we have not consider the effect of dividend payment and reinvestment. Buy-and-Hold strategy would be able to seize all dividend payments while trading through technical indicators might not be able to do so. These shows that successful technical trading method should provide enough profits to cover transaction costs involved and the loss in dividend payment.

The use of Technical Analysis in the above analysis would be called by someone who is suspectable to this analysis method as back-testing which could only identify strategies that would have worked in the past but not in the future. Back-testing may show important facts about the market, yet it may also only show temporary trends or statistical aberrations. We should, therefore, remember that market research is based on the past. Thus, at best, technical analysis can only reveal probability, not certainty. A strategy found through back-testing of past data should be retested on a different time period in order to prove its validity. Although I have tried my best to make this research as useful as possible, in view of the time and resources constraint, it is inevitable that the



empirical test in this research paper contains certain limitations to be overcome in future studies. They are the limited extent of the time period for the study, the assumption of trading at exactly the time of turning point and the small number of technical indicators used. All these limitations suggest there is still a whole realm of technical analysis methods subjected to further study using Hong Kong Stock Market data.

In this research, the trading tests are for only one predictive variable, rather than for a combination. In the increasingly complicated capital market of Hong Kong, it is likely a more complex rule would be required to generate profit. Therefore, it might be more sensible for us to adopt a holistic approach meaning different Technical Analysis Techniques are employed simultaneously so that they would confirm each other, in effect giving a more accurate prediction of the stock market trend instead of producing false signals. The holistic approach is one which requires different technical indicators to confirm each other before signals are regarded to be genuine. This method can include all the technical indicators in this research study. One such method is given by S. C. Huang which suggests the following procedures:

1. Identify the market trend with the moving average method
2. Measure the momentum of the market trend
3. Measure the genuineness of the market trend by the diffusion index of advancing and declining issues of the Hong Kong Stock Exchange
4. Discern the relationship between the level of volume and market index change

The relative importance of those indicators, however, should be given to the volume factor before other indicators like market direction, momentum and



diffusion index. This research study, in fact, has demonstrated the potential gains of using volume analysis through its ability to outperform the market. If this holistic approach can eliminate the problem of false signals, time precisely the buy and sell signals, and provide enough profits to cover transaction costs, it would be the key for successfully employing Technical Analysis Techniques.

### Concluding Remarks

In this paper, I have attempted to delineate the basic theory concerning investing using Technical Analysis Techniques. Opposing theories like random walk theory and efficient market hypothesis are also discussed to reveal the theoretical foundations of Technical Analysis. Up to this moment, there is still no definite acceptance or denial of the validity of Technical Analysis methods. But the mere fact that thousands of investors are using such methods indicates Technical Analysis would at least assist, if not determine, investment decisions.

The ultimate test for investors is whether a particular trading technique, if performed correctly, will consistently make money. Therefore, ways of applications is also performed using Hong Kong Stock Market data. Four commonly used Technical Analysis Techniques (Moving Average, Momentum, Diffusion Index, Volume) are chosen for their convenience to use. It is found that the return of the chosen trading rules (except the 3-day moving average Volume method) could not beat the market performance. Technical Analysis Techniques does not seem to give exceptionally profitable trading in the Hong Kong context, even before we take into consideration the factors of transaction costs and loss of dividend. However, it is found that technical analysis methods can capture major short/intermediate market movements. The reasons for

overall trading loss are inaccurate timing of buy & sell signals and the relatively large percentage of false trading signals given. If such problems can be solved by the holistic approach suggested in the recommendation section of this research, it is likely that Technical Analysis can be profitable investment method in the Hong Kong Stock Market.



## APPENDIX 1

CORRELATION COEFFICIENT : DAILY PRICE CHANGES  
VERSUS LAGGED PRICE CHANGES FOR  
EACH DOW JONES INDUSTRIAL COMPANY

=====			
	LAG	IN	DAYS
STOCK	1	5	10
-----			
Allied Chemical	.02	-.03	-.01
Alcoa	.12	-.02	-.03
American Can	-.09	-.02	-.04
AT & T	-.04	.01	.01
American Tobacco	.11	.01	.04
Anaconda	.07	.00	-.06
Bethlehem Steel	.01	-.05	-.02
Chrysler	.01	-.02	.02
Dupont	.01	-.00	.00
Eastman Kodak	.03	-.02	.00
General Electric	.01	-.00	.01
General Food	.06	-.02	-.02
General Motors	-.00	-.04	.01
Goodyear	-.12	-.00	.01
Int'l. Harvester	-.02	-.05	-.02
Int'l. Nickel	.10	.03	.03
Int'l. Paper	.05	.05	-.02
Johns Manville	.01	-.03	.03
Owens Illinois	-.02	.09	-.04
Procter & Gamble	.10	-.02	-.02
Sears	.10	.01	-.01
Standard Oil (Cal.)	.03	-.05	-.04
Standard Oil (N.J.)	.01	-.05	.08
Swift & Co.	-.00	.06	.00
Texaco	.09	-.02	.01
Union Carbide	.11	-.04	-.04
United Aircraft	.01	-.07	-.02
U.S. Steel	.04	.01	-.04
Westinghouse	-.03	.00	.01
Woolworth	.03	-.04	-.01
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Average	.03	-.01	-.01
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Source : Eugene Fama, "The Behavior of Stock Market Prices." Journal of Business, Jan, 1965.

APPENDIX 2

RESULTS OF MOVING AVERAGE DECISION RULE

5 Percent Penetration

	Average Return per Stock (%)	Average Return per Stock per week (%)	Average Return per Stock per week (%) annualized	Average Transactions per Stock
	Net	Net	Net	
Buy and Hold	30	0.18	10	2
Moving average strategy (long and short)	54	0.20	11	15.2
Moving average strategy (long only)	56	0.32	18	8.0

Source : Paul H. Cootner, "Stock Prices : Random versus Systematic Changes," Industrial Management Review, Vol 3 (Spring 1962), pp. 24-25.



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